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# PREVENTION OF BLINDNESS

## An Appraisal of Progress and Critical Needs

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**Addressing the recent Congress of the Pan American Association of Ophthalmology, Dr. Berens outlined the mutual problems that bring the countries of the Western Hemisphere closer together.***

THIS meeting of the leaders in ophthalmology and in the prevention of blindness in the Western Hemisphere will aid not only in the speedy dissemination of important scientific knowledge but also will further the eradication of unnecessary blindness. The fact that there are approximately 350,000 blind persons in the United States of America and that about 30,000 are added each year offers a great challenge to all of us.

In planning sound programs for the prevention of blindness it is clear that thorough studies of causes of blindness by etiology, by site and type of condition, and by various social factors are of importance. With this objective in mind a twofold classification of the causes of blindness was prepared.[1] The committee responsible for this classification is sponsored jointly by the National Society for the Prevention of Blindness and the American Foundation for the Blind. The work of Dr. Ralph G. Hurlin and C. Edith Kerby in the United States since the beginning of this program in 1930 has been outstanding. During the last few years the constructive activity of Dr. Schappert-Kimmijser and her fine cooperation with that of Duke-Elder, Arnold Sorsby, A. Franceschetti, P. J. Waardenburg, and Franklin M. Foote have brought the classification closer to universal acceptance.

A revised classification was adopted by the Pan American Association of Ophthalmology in 1948 and by the International Association for the Prevention of Blindness in 1950.[2] In 1957 the classification was again revised and further changes are now being made. In addition, an accompanying booklet is being prepared so that the classification will be more readily adaptable to world use. By the universal use of the classification statistics would be available which would provide a better understanding of the problems of blindness in our ever-contracting world. More effective preventive measures could then be instituted.

The data already obtained have provided a basis for planning prevention of blindness programs to meet the needs of various age groups and various sections of our country. When upward trends or new causes appear in the data these problems are noted and programs are adapted to meet the challenge. To the extent that reports

* Presented before the Congress of the Pan American Association of Ophthalmology, Caracas, Venezuela, February 3, 1960.

reflect decreases in blindness from specific causes they offer encouraging proof that much loss of sight is being prevented.

### Result of Cooperative Effort

The decline in certain causes of blindness during the past 50 years is the result, for the most part, of the cooperative efforts of ophthalmologists with public health officials; prevention of blindness organizations and social agencies; advances in medical science; improved methods of medical and surgical treatment and sound legislation.

Statistics reveal that blindness due to infectious diseases has declined. Smallpox is virtually unknown in the United States; the incidence of syphilis as a cause of blindness is 60 per cent less than it was 20 years ago; eye injuries show a decrease of 40 per cent in the same period; and ophthalmia neonatorum and trachoma (except among the Indian population[3a]) are now rare causes of blindness in North America. The isolation of the virus of trachoma and the possibility of developing a vaccine gives renewed hope that this serious blinding eye disease will finally be eradicated. In contrast to this encouraging picture the incidence of blindness of prenatal origin presents a most unfavorable picture, because our knowledge of prenatal factors is inadequate.

The value of the Credé method of using silver nitrate in the eyes of the newborn is still accepted in spite of much recent research with numerous antibiotics and the critical study of the problem by individual scientists and several local and national committees.[4,5] The Credé method is credited with reducing blindness from ophthalmia neonatorum in children attending schools for the blind in the United States from 28 per cent in 1907 to 0.1 per cent in 1954–55. This accomplishment is attributed mainly to the work of the National Society for the Prevention of Blindness in cooperation with national and local health authorities.

In 1957 the Columbia-Presbyterian Medical Center discontinued the use of silver nitrate as a prophylactic measure. At that time the incidence of ophthalmia neonatorum at the Center was 0.013 per cent but over a period of six months in 1959 it rose to 0.2 per cent. Therefore, in October 1959 the Center reinstituted prophylaxis for gonorrheal ophthalmia.[6]

### Reduction in Retrolental Fibroplasia

The prevention of blindness from retrolental fibroplasia is one of the outstanding accomplishments of the century. In New York State alone the number of children reported blind from this disease in 1953 was 201, but of those born in 1958 only three developed this affliction. This triumph in preventive medicine was made possible by the penetrating observations of Terry of Boston and Crosse of Australia, coupled with the brilliant research of men like Ashton in London and clinicians in many countries. In the United States ophthalmologists, consulting physicians and scientists, working as a team, did much to clarify the problem and force acceptance of the idea that the most important cause of retrolental fibroplasia was too much oxygen administered to premature infants.

Annual eye screening tests of children are an established procedure in most of our schools today. Many of

the ocular conditions discovered existed long before the child entered school. It is important, therefore, to give every three-year-old child a complete eye examination. The National Society for the Prevention of Blindness has sponsored preschool vision testing programs for years in an effort to detect loss of vision from amblyopia and other causes as early as possible. Approximately 8,600 school children whose corrected vision is less than 20/70 are now provided with special educational facilities as a result of the brilliant pioneer work of Winifred Hathaway.[7]

The new approach to the diagnosis and treatment of amblyopia through the use of the visuscope and euthyscope and the techniques of pleoptics offer a better understanding of some of these problems and have resulted in improving vision in more amblyopic eyes. Improvement in the optics and methods of dealing with lowered visual acuity has reduced the number of children who have to be taught Braille and newer procedures should cause a further reduction in this group.

### Eye Injury Record

Eye injuries and accidents still cause too much blindness. Approximately 17,000 people in the United States are totally blind as a result of industrial injuries, trauma or carelessness in the home, and at least another 170,000 have lost the sight of one eye through injury. Blindness through chemical and other eye injuries is gradually decreasing through research into better preventive and curative measures, combined with the education of workers.

The National Society for the Prevention of Blindness sponsors the Wise Owl Club.[8] Its membership is restricted to industrial employees who have actually saved their sight by wearing protective goggles or other devices. This organization has stimulated many industrial workers to follow the wise preventive practice of wearing eye safeguards. Among its members 25,000 eyes have been saved.

In spite of the fact that progress has been made in preventing injuries from fireworks used to celebrate our national independence, such accidents still occur. In 1951 in the State of Illinois there were 56 eye injuries attributed to fireworks. In the same state from 1950 through July 4, 1956 seven of the eleven deaths due to fireworks were caused by sparklers. Although many of our states have fireworks control laws, attempts are being made to have every state pass a model law. Efforts are being directed toward alerting our citizens to the dangers of the indiscriminate use of fireworks.[9]

### Investigation of Uveitis

Prevalent among the older population is uveitis, which continues to cause much unnecessary blindness (12 per cent or more according to estimates) throughout the world as well as in the United States. At least part of the high rate of blindness from uveitis[10] is attributed to the fact that in many patients the underlying cause is not known with certainty. Toxoplasmosis,[11] brucellosis and streptococcal infection are being given greater consideration. The treatment of toxoplasmosis, after Wilder[12] showed that adult eyes were affected, has resulted in the saving of some eyes afflicted with granulomatous uveitis. Possibly improved methods of diagnosing and treating chronic streptococcal infections may save some

eyes in the nongranulomatous uveitis group. Careful scientific work combined with clinical investigations are needed to make diagnoses less presumptive. The possible role of viruses in uveitis has not been clarified in spite of the fine work being done in the virology laboratories in many parts of the world. Fortunately, the role of tuberculosis is now considered minor in the United States.

### Glaucoma Study and Control

Concerning the mechanism of glaucoma much basic work is being done in our country, especially by Grant and Becker. The meticulous studies of the families of glaucoma patients by Becker should be rewarding. Glaucoma detection projects have been conducted on a large-scale basis in many areas of California, Colorado, Connecticut, New Mexico, New York, Pennsylvania, Tennessee, Massachusetts and Texas as well as in the District of Columbia, in cooperation with the National Society for the Prevention of Blindness. These studies offer a promise for the future of preventive ophthalmology in this important disease, which accounts for at least 14 per cent of blindness among adults in the United States.

The training of general practitioners and their cooperation in the early diagnosis of glaucoma in clinic and office practice, and education of the public concerning the disease, should aid in preventing blindness.[13,14] Moreover, the education of general physicians in tonometry as a part of their routine examination of patients over 30 years of age should reduce blindness from this insidious disease. For the final determination of the underlying cause or causes of chronic simple (open angle) glaucoma the continued efforts of men like Duke-Elder in England, Goldman in Switzerland, and François and Weekers in Belgium are leading us closer to the truth. I hope that studies of the underlying causes of uveitis producing secondary glaucoma will receive increased consideration. The work of Rhode on the basic sciences in the field of glaucoma should prove fruitful.

Additional research is needed in relation to diabetes as it affects the eyes. A recent investigation in Massachusetts revealed that 17 per cent of blindness in that state is caused by diabetes. Furthermore, among the newly-blinded being accepted for service by the Lighthouse of the New York Association for the Blind the greatest number are afflicted with diabetic retinopathy.

Eye tumors, although rarely bilateral and fortunately causing only a small percentage of blindness, are responsible for some loss of vision and for untimely death. The outstanding studies on radiation and certain chemicals for the treatment of tumors by Reese and the increased use of light coagulation due to the brilliant work of Meyer-Schwickerath should lead to prevention of some blindness from this source.

### Critical Research Needs

Although the record in regard to preventing blindness is improving, future progress will depend largely upon detecting the underlying causes and most efficacious treatment of blinding eye diseases. Unfortunately, for many years the emphasis in the United States has been on the care of the blind and the diseased individual, with little thought and almost no money available for prevention of blindness and disease through research into the

underlying causes.[15] It seems out of proportion that, in 1950, 150 million dollars were spent for the care of the blind alone, exclusive of the great cost of caring for persons with eye diseases and injuries.

In 1958, 294 million dollars were appropriated by the Congress of the United States for the National Institutes of Health to support medical research. Of this sum, only five million dollars or less than two per cent were allocated to research in ophthalmology. In 1959, public and private funds provided 150 million dollars for the care of the blind. But only four million dollars were contributed from public and private funds for research in the prevention of blindness.[16] It is expected that government support of research will increase and that by 1970, 500 million dollars will be appropriated annually. Furthermore, it is predicted that philanthropic and industrial organizations will allocate an equal amount.

A number of developments have led to this increase in funds for preventing blindness in addition to the awareness of the mounting costs of caring for the blind and for those with eye diseases and injuries. One of the most important was the organization of the Association for Research in Ophthalmology in 1928,[17] for this national association and its active sections have stressed the necessity for the close cooperation of scientists in other disciplines in preventing unnecessary blindness.

### Increasing Support

Another important factor was the development of organizations for the purpose of supporting eye research. Among these are: The Ophthalmological Foundation, Inc. (1930); the Snyder Ophthalmic Foundation, Inc. (1941); the Eye-Bank for Sight Restoration (1944); the National Council to Combat Blindness (1946); the Retina Foundation, Inc. (1950); the Council for Glaucoma and Allied Diseases (1952); the Eye Research Foundation (1953); the National Committee for Research in Ophthalmology and Blindness (1956), and Research to Prevent Blindness (1960).

A third contributing factor was the allocation of funds for research by the National Society for the Prevention of Blindness, beginning in 1945. A fourth influence has been the establishment of several large research centers. Among these are the Wilmer Institute of Johns Hopkins University; Eye Institute of Columbia University; New York Eye and Ear Infirmary; Wills Hospital; Washington University; the Howe Laboratory of the Massachusetts Eye and Ear Infirmary; New York University; University of California; the government-supported National Institutes for Neurological Diseases and Blindness and many others. In addition to the research in progress, men are being trained in research techniques and teaching. The importance of these concerted efforts to promote research is emphasized when we realize that in 1956 a study of 23,000 blind persons in the United States revealed that in 56 per cent of the group the cause was classified as unknown to science or not specified.

In the United States the American Board of Ophthalmology has contributed to the prevention of blindness by elevating the standards of ophthalmology. This is accomplished by determining the competence of ophthalmologists who desire certification; conducting examinations for candidates;

issuing certificates to those who qualify, and acting as advisers to prospective students of ophthalmology. The prime object of the Board is to pass judgment on the education and training of competent and responsible ophthalmologists. By requiring its candidates to have adequate training and experience and by cooperating with the Council on Medical Education and Hospitals of the American Medical Association the Board has been a bulwark against unethical practices and an inspiration to ophthalmologists to maintain the highest professional standards.

### Summary and Conclusions

In the United States the most critical needs in the field of prevention of blindness are intensive research, the utilization of newer knowledge developed through basic science and other studies, increased efforts by social and public health groups, and broader education of the public and general physicians.

It is my hope that an ever-increasing number of ophthalmologists in the Western Hemisphere will appreciate their responsibility not only to practice their professions but also to keep alert to their own possibilities for preventing blindness and advancing science. This can be done by augmenting knowledge through research and education and by aiding the organizations engaged in the conservation of vision. World-wide cooperation in the fight against blindness would probably reduce its incidence so markedly that money now used for the care of the blind would be available for research. This would lead to a decrease in the number of individuals unnecessarily blind in the Western Hemisphere.

I would like to pay tribute to our colleagues in the Latin American countries for their contributions to the prevention of blindness. Outstanding work has been done in the field of tropical ophthalmology, in trachoma control, glaucoma, and many other areas. Many of the prevention of blindness problems are similar all over the world. Among these are preventing ophthalmia neonatorum, routine examinations of the eyes of school children, improving health conditions among the general public and raising the standards of the medical profession. All these mutual problems not only bring us closer together but also make us realize the importance of the Pan American Association of Ophthalmology in promoting a common front in our attack on blindness.

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DRIVER RESEARCH—The University of Indiana will receive $50,000 from the American Optometric Foundation for a three-year study of new methods for testing night vision of drivers.

## PSYCHOLOGICAL STUDY OF GLAUCOMA

A psychological, social and medical survey of 19 patients with primary glaucoma, compared with a similar study of 16 patients with nonglaucomatous eye disease, refuted the general concept that there is a particular personality configuration specific to glaucoma. A. S. Berger and C. N. Zimet report in *Psychosomatic Medicine* that they matched the two groups as to age, sex, race, socioeconomic class, chronicity of eye disease and degree of impairment. Along with a review of the family and case history, testing consisted of the Minnesota Multiphasic Personality Inventory and the Draw-A-Person Test.

From a social and psychiatric viewpoint the two groups were strikingly similar. Both displayed prominent neurotic personality traits, particularly depression, which increased with increased visual impairment rather than according to diagnosis. Diabetes mellitus and blindness occurred more frequently among the glaucomatous patients and their families; bronchial asthma was far less common.

This investigation indicates that the eye is a vulnerable organ for psychosomatic expression, but this is without regard to this particular disease.

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### ANNUAL MEMBERSHIP MEETING

The Annual Membership Meeting of the National Society for the Prevention of Blindness will be held in the Salon de Musique, Barbizon-Plaza Hotel, 106 Central Park South, New York City, on December 8, 1960 at 4:00 P.M.

All members and friends of the Society are cordially invited to attend.

# THE STORY OF ASTIGMATISM

JAMES E. LEBENSOHN, M.D.
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**The condition was thought to be a rare anomaly until Donders began his important studies just a hundred years ago.**

DONDERS was the first great ophthalmologist to investigate assiduously the problems of refraction, and the first to impress upon the profession the prevalence and importance of astigmatism. His initial paper on this subject, which appeared just a century ago in Graefe's Archiv, introduced the term "Astigmatismus" to the German language.

The primary discoveries relating to this condition, which results from irregularities in the curvature of the eye's refractive surfaces, were made by such eminent physicists and mathematicians as Newton, Euler and Fresnel. Thomas Young, an English physician, was the first to reveal and measure the astigmatism of a human eye. In 1801 he reported that he had discovered the condition in his own eye while he was using his optometer, an instrument originally designed for measuring simple myopia and hyperopia.

"I have never experienced any inconvenience from this imperfection," he wrote, "nor did I ever discover it until I made these experiments. When I look at a minute lucid point, it appears never as a perfect point, unless I apply a concave lens inclined at a proper angle, to correct the unequal refraction of my eye." Young supposed that his astigmatism was due to an obliquity of his crystalline lens, a view supported by the observation that some nearsighted persons secured improved acuity with their lenses appropriately tilted.

### Use of a Cylinder

In 1827 the English astronomer George B. Airy first utilized a cylinder for the correction of astigmatism. His published reports stimulated intellectuals in England and America to note their own astigmatism and to attempt correction. In 1828 John McAllister of Philadelphia ground the first lens ever made in this country for correction of this condition.

In 1849 George Gabriel Stokes, English physicist, introduced a test based on two cylinders of equal but opposite power. As the cylinders were rotated from the neutralizing position, an astigmatic lens was formed of a power varying gradually from zero to twice the power of either lens. The Stokes lens, though in use as late as 1900, could give only an approximate measurement of well-marked astigmatism. The idea survives now only as a malingering test in a simplified adaptation by Edward Jackson.

The ophthalmometer of Helmholtz, invented in 1854, was used extensively by Donders in 1860 to demonstrate the hitherto unsuspected prevalence of significant corneal astigmatism. In 1862 he published in Dutch a mono-

graph on "Astigmatism and Cylindrical Lenses" which was forthwith translated into German by Karl Schweigger and into French by Henri Dor. As a consequence of this work cylinders were henceforth added to the trial case of the refractionist.

Two years later Donders' book, "On the Anomalies of Accommodation and Refraction of the Eye," was published in English. In the words of Duke-Elder it is "one of the few classics that have caused a revolution in ophthalmology." Donders emphasized that diminution of acuity was the most important symptom of astigmatism. Because of this affected persons are obliged to read at a closer distance and hence suffer from accommodative fatigue. "In astigmatic patients," he wrote, "there exists a certain indifference for (spherical) lenses. It is impossible to make a definite choice. This phenomenon led me long ago to suspect that the diminished acuteness of vision might be dependent on abnormal astigmatism."

### Studies at Utrecht

Ophthalmologists from everywhere flocked to Utrecht to study under Donders. Among these future leaders of American ophthalmology were Ezra Dyer of Philadelphia, Hasket Derby of Boston, and John Green of St. Louis. After Green arrived in 1865 he was inspired to devise a more reliable test for the detection and measurement of astigmatism than those previously used. The astigmatic chart in optometers had been unsatisfactory because of the disturbing influence of accommodative efforts. To eliminate this factor he introduced large test-diagrams hung on the wall at a distance of 20 feet, and he appropriately fogged the eye examined. Among the types of charts he devised are those having radiating lines, rotating dials, blocks of lines and duplicated, triplicated and dotted lines. Verhoeff in 1899 suggested that the axis of astigmatism could be determined by simply rotating a cross dial until the lines appeared equally distinct. This idea was featured in the arrow charts of Maddox, Raubitchek and Lebensohn. Other charts in which the background contrast was reduced proved less useful than those with the greatest contrast and simplest pattern, as advocated by Lancaster.

The American neurologist Weir Mitchell first proposed that astigmatism and eyestrain may be the cause of otherwise unexplained nervous irritability, headache and gastric malfunction. In 1876 he stated that in patients without ocular discomfort or fatigue the strain may be evidenced solely by headaches, and that the long continuance of uncorrected refractive errors may be the unsuspected cause of insomnia, nausea and general failure of health. His teachings left a permanent imprint, made America eye-conscious and especially astigmatism-conscious. Edward Jackson was convinced that "minute accuracy in measuring astigmatism may generally make the difference between relief and non-relief for the patient."

### Improvement in Ophthalmometer

The Helmholtz ophthalmometer that led Donders to detect the prevalence of astigmatism was a laboratory contrivance that required skilled observation, numerous readings and tedious calculation. In 1881 Javal and Schiøtz perfected an accurate but simplified

instrument known as the Javal-Schiøtz ophthalmometer with which more measurements were made in a day than with the Helmholtz apparatus in the previous 25 years. As a consequence of this triumph of automation the examination for astigmatism became widespread and the previous hesitancy in prescribing cylinders was overcome. By 1894 cylinders were ground by machinery and the advent of the twentieth century heralded the manufacture of toric lenses. Though flat lenses were cheaper, less conspicuous and caused less reflections, the superior performance of toric lenses gained such general acceptance that by 1920 the flat lens was almost obsolete.

Retinoscopy was discovered by Cuignet in 1873 but its principles were first elucidated by Landolt, who in 1886 christened it skiascopy or the shadow test. Shortly before this date, a paralysis of accommodation caused by diphtheria led Edward Jackson to read Donders. This masterwork so fascinated him that he gave up general practice for ophthalmology and soon became the Donders of America. His classic, "Skiascopy and its Practical Applications to the Study of Refraction," published in 1896, clarified the technique and emphasized its importance as the most accurate of all methods for the objective determination of the refraction, including the degree and axis of astigmatism.

After Jackson announced his new cross-cylinder tests in 1893 the Helmholtz ophthalmometer and to a less extent astigmatic charts followed into desuetude the optometer, the cobalt-blue glass and the stenopaic slit. Cycloplegic examination of persons under 40 became the conventional routine. Said A. R. Baker of Cleveland: "You might as well try to fit a man with a suit of clothes while he is running down the street as to try to fit glasses without a mydriatic."

Contact lenses, introduced in 1887 by the ophthalmologists Fick and Mueller independently, are the only means of correcting conical cornea and irregular astigmatism. In the few cases where spectacle corrections of strong or unequal astigmatism occasion lasting discomfort contact lenses are a desirable alternative.

After 1900 the examination for astigmatism had become so commonplace that thousands of cases were analyzed by numerous authorities. It was soon discovered that astigmatism is not a fixed quantity but varies with age; that a symmetry of astigmatism in both eyes is frequent, both in the degree of error and in the direction of the axis; and that the further the eyes veer from the norm the more common is the occurrence of astigmatism.

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## ROUTINE EYE EXAMINATION OF PRE-SCHOOLERS ENDORSED

The New York City Health Department Pediatric Advisory Committee urges doctors to make the appraisal of eyes a standard part of the physical examination of young children. The group unanimously approved a recommendation of the department's Ophthalmology Advisory Committee as follows:

"A physical examination of children should always include an appraisal of their eyes. This should include search for obvious squint, an external ocular examination, an attempt at ophthalmoscopy and a measurement of vision at least by the age of four."

This action was reported in *New York Medicine* of January 1960.

# HEREDITARY EYE PROBLEMS

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**Dissemination of available knowledge relating to ocular genetics should contribute materially to the prevention of inherited blindness.***

RADICAL changes have occurred in the major causes of blindness during the last 25 years. The advent of successful immunology, antibiotics, safety programs and modern sanitation has resulted in a marked decrease in incidence of the environmental causes. There remains, however, a relative increase in the incidence of the developmental, metabolic, neoplastic, and degenerative ocular diseases. A large proportion of these are influenced by genetic factors. As a consequence, in order correctly to diagnose, classify and adequately treat these diseases the ophthalmologist requires a working knowledge of human genetics.

It is also requisite, in my opinion, that the lay worker in the field of blindness possess a basic understanding of human genetic principles. A considerable public service can be rendered by both lay and the professional individuals capable of disseminating available knowledge pertinent to the genetic transmission of ocular disease. The simple expediency of sterilization, or of not having more children, may prevent much human suffering and visual handicap.

*Presented at the Annual Conference of the National Society for the Prevention of Blindness, Denver, Colorado, March 30, 1960.

An informed public can do much to lower the rising incidence of hereditary ocular disease. Each of us has a moral and biologic obligation to endow our offspring with the best possible physical and mental equipment. To do less questions our right to parenthood. The public is awakening to this understanding. Not a day passes but that some inquiry is received by us requesting information concerning the possible inheritance of various ocular pathological entities.

While considerable data is wanting pertaining to the genetic risk factors of transmitting ocular disease, there is much available. Such splendid ophthalmic genetic texts as written by Sorsby, and more recently by Francois, are up-to-date and most valuable.

Presented here is a classification of the types of ocular disease states and their usual hereditary patterns of transmission which produce visual loss of varying degree, either at birth or within the first year or two of life. Considerable liberty is taken with the inclusion of several of the syndromes but none have been listed unless personal experience justifies so doing. A complete presentation, however, is beyond the space available here. In addition, wherein possible, the risk

factor of transmission for several of the most common diseases (as modified from Cuendet and Francois) is presented in percentages in tabular form.

Human ocular disease is particularly intriguing in that the same clinical disease may be inherited in various modes of transmission in different families. Retinitis pigmentosa, a hereditary degeneration of the retina, is an excellent example of this phenomenon since approximately six different types of inheritance patterns are now recognized. Careful individualization of each case and of that individual's family is thus necessary before any genetic advice or prognosis is given. A pedigree of the specific family is a requisite to understanding how the particular gene behaves in that family. In several cases this behavior will be entirely contrary to the expected mode of transmission as expressed in the literature. To rule out phenocopies (traits similar to the products of mutant genes yet due to the effect of noxious intra-uterine agents) a careful history of the maternal health of the mother of the case being studied is always necessary.

## HUMAN GENETICS

There are 46 chromosomes in the human germ cell (sperm or ova); 22 of these have a like paired chromosome which is called an autosome. Any gene localized on such a chromosome is called an autosomal gene. Genes for a particular trait or function occupy the same locus on each of the paired chromosomes; these are termed alleles. Only two alleles, one on each chromosome, can be present in an individual at any time, although many mutant genes—alleles—may exist in the population in other individuals. Such mutations usually occur spontaneously and are permanent minor alterations in the complex protein molecule which comprises the gene. Some mutations result from grosser alterations of the chromosome body. These mutations, capable of reproducing themselves, are now transmitted generation to generation and are responsible for a considerable amount of deleterious ocular disease. It has been conservatively estimated that there are some 250 or more mutant genes which effect ocular disease or aberrant structure.

Genes located on the sex chromosomes (X and Y) are sex-linked; the X and Y chromosomes are uniquely responsible for the determination of sex. The presence of two X chromosomes results in a female; the presence of a single X chromosome in an individual produces a male. Genes localized on either of these sex chromosomes (unlike in size and shape) are sex-linked. The traits resulting from their enzymatic or hormonal action are sex-linked diseases or traits.

Genes vary considerably in their relation to their respective alleles. One may be dominant to the other or recessive (hidden); when dominant the mutant gene usually expresses its appearance even in the presence of its allele; when recessive the gene's action is suppressed or hidden by the action of the normal gene or other mutant allele. Such terms—recessiveness or dominance—are actually only relative terms since much depends upon environmental factors and the genetic milieu of the individual as to the end product of the gene. In other words, no one gene acts alone but rather in a pool of other genes, the interaction of which can either modify, suppress or

augment the action of a single gene. The effect of environmental factors and the gene pool greatly complicate the giving of genetic advice.

While most of the known modes of genetic transmission are well illustrated by ocular disease entities, in general autosomal recessive, autosomal dominant and recessive sex-linked inheritance are most commonly encountered. The essential features of these patterns of transmission follow:

#### Autosomal Dominant

An autosomal dominant gene presents the following characteristics in a pedigree:

1. An affected individual has one of his two parents affected.
2. An affected individual is capable of transmitting the gene to 50 per cent of his or her offspring.
3. The gene is transmitted from generation to generation.
4. Unaffected individuals do not have the gene and cannot transmit it to their offspring.

#### Autosomal Recessive

A recessive autosomal gene must be present on both loci of the paired chromosomes for the trait to be expressed. The following characteristics are encountered in such a pedigree:

1. An affected individual has normal parents but both are carriers of the gene.
2. An affected individual transmits the gene to each of his or her offspring who do not manifest the trait since their normal gene allele prevents its expression.
3. The parents of an affected individual, particularly in rare traits, are not uncommonly related (cousins) since it is more likely for related individuals to be carrying the same rare mutant gene in their germplasm.
4. Each brother and sister of an affected individual has a 25 per cent chance of being similarly affected.

Such a pedigree shows the disease usually to be restricted to one sibship (family) and the disease is frequently termed familial in the literature.

#### Sex-linked Recessive

A gene located on the sex chromosome may be recessive (or dominant); it is associated or linked with sex. An amazing number of ocular diseases result from the presence of mutant recessive genes localized on the X chromosome and it is for this reason that the discussion is limited to this mode of inheritance.

When a gene is situated on the non-homologous portion of the X chromosome, which for all purposes has no counterpart in the Y chromosome, the pedigree exhibits a criss-cross type of inheritance pattern. The characteristics are:

1. An affected individual is usually a male.
2. An affected individual's parents usually are clinically normal.
3. The gene is transmitted through carrier females (clinically normal) and expressed in 50 per cent of their male offspring.
4. All of the daughters of an affected male are carriers of the gene.
5. All of the sons of an affected male are normal for the trait since they receive *only* the Y chromosome from him.
6. The female offspring of carrier females have a 50 per cent chance of getting the abnormal gene.

Following is a classification of common ocular diseases, either congenital or occurring in early infancy. Their more common inheritance patterns are also listed, several of which necessitate a question mark since much more study is indicated. A knowledge of these inheritance patterns and clinical behavior can be employed to prevent blindness by:

a. voluntarily abstaining from further pregnancies;

b. recognizing or anticipating the appearance of the disease in other members of the family. This will not infrequently permit instigation of early therapy and prevention of the ocular ravages of the disease.

## CLASSIFICATION TABLE

D = dominant A = autosomal
R = recessive X = sex-linked
I = intermediate Ir = irregular

### EYE AS A WHOLE

| | |
|---|---|
| 1. Anophthalmos—true absence of the eye | AR |
| 2. Hydrophthalmos—congenital glaucoma | AR |
| 3. Microphthalmos with associated defects | AD<br>AR<br>RX |
| 4. Congenital myopia—with or without nystagmus | AR<br>RX |
| 5. Nystagmus—without macular lesions | AD<br>DX |
| Nystagmus—with ocular albinism | IX |
| Nystagmus—with universal albinism | AR |
| 6. Pure microphthalmos | AD<br>AR |

### CORNEA

| | |
|---|---|
| 1. Congenital ectasia of cornea | AD |
| 2. Congenital staphyloma of cornea | AD |
| 3. Congenital corneal dystrophy | AR |
| 4. Cornea plana, with or without associated defects | AD<br>AR |

### LENS

| | |
|---|---|
| 1. Congenital total cataract | AD |
| 2. Ectopia lentis—dislocated lens | ADIr |
| 3. Ectopia lentis with ectopia pupillae | AD<br>AR |
| 4. Spherophakia | AR |
| 5. Zonular cataract—central cataract | AD |
| 6. Lenticonus | AD<br>AR |

### UVEAL TRACT
### (Iris, ciliary body and choroid)

| | |
|---|---|
| 1. Aniridia | AD |
| 2. Multiple congenital anomalies of anterior chamber | AD<br>XR |
| 3. Ectopia pupillae | AD<br>AR |

### CHOROID

| | |
|---|---|
| 1. Coloboma of choroid and/or iris | IrDA |
| 2. Choroideremia | XI |
| 3. Coloboma of macular area | AD |

### RETINA

| | |
|---|---|
| 1. Best's disease—macular degeneration | IrAD |
| 2. Macular cystic degeneration | XR |
| 3. Congenital hereditary retinoschisis | XR |
| 4. Congenital hereditary retinal degeneration | AR |
| 5. Congenital night blindness with myopia | XR |
| 6. Punctata albescens | AR |
| 7. Congenital achromatopsia | AR |
| 8. Congenital (blue-cone) monochromatism | XR |
| 9. Retinitis pigmentosa | XR<br>IX<br>AR<br>AD |
| 10. Retinitis pigmentosa with deafness | AR |
| 11. Retinitis pigmentosa—with CNS disease | AR |
| 12. Infantile amaurotic idiocy | ? IrD<br>? AR |
| 13. Congenital falciform detachment | XR<br>AR |
| 14. Congenital pseudoglioma | XR |
| 15. Retinoblastoma | ± AD<br>IrAD |
| 16. Inverse retinitis pigmentosa | AR |

### OPTIC NERVE

17. Congenital optic atrophy (hereditary) — AR, AD

### METABOLIC DISEASES WITH OCULAR ASSOCIATION

1. Universal albinism — AR
2. Infantile amaurotic idiocy (lipoid) — AR ?, IrD ?
3. Oculo-cerebro-renal syndrome (Lowe) — AR
4. Hurler's syndrome — AR
5. Letterer-Siwe disease (uveal tract) — AR ?

### SYSTEMIC DISEASES WITH OCULAR MANIFESTATIONS

A. Skeletal System
1. Osteopetrosis (optic atrophy) — AR
2. Crouzon's disease (optic atrophy) — ADIr
3. Apert's syndrome (optic atrophy) — ADIr
4. Status Bonnevie-Ullrich — ? IrAD

B. Central Nervous System
1. Erythroblastosis — AR
2. Schilder's disease — XR
3. Pelizaeus-Merzbacher's disease — XR
4. Cerebral sclerosis — XR
5. Mental deficiency with microphthalmos — ? XR

C. Skin and Mucosa (with or without central nervous system disease)
1. Keratosis follicularis spinulosa cum ophiasi — XR
2. Neurofibromatosis — AD
3. Ichthyosis — XR, AR
4. Sturge-Weber disease — ADIr
5. von Hippel-Lindau disease — ADIr
6. Laurence-Moon-Biedl — AR
7. Epiloia — AD

## SUMMARY

Dissemination of available knowledge pertaining to ocular genetics by lay and professional workers caring for the blind should materially contribute to prevention of inherited blindness.

### GENETIC PROGNOSIS OF THE PRINCIPAL AUTOSOMAL OCULAR DISEASES (CUENDET)

Risk, in percentage, of having further affected children

| Ocular Diseases | No Affected Cases in Family | | Mother or Father Affected | | Mother and Father Affected | One Child Affected Parents Normal | Mother or Father Affected One Child Affected | One Grand-parent Affected | One Aunt or One Uncle Affected |
|---|---|---|---|---|---|---|---|---|---|
| | No Consan-guinity | Parents First Cousins | No Consan-guinity | Parents First Cousins | | | | | |
| 1. Universal Albinism.. | 0.0067 | 0.058 | 0.82 | 13.3 | 100 | 25 | 50 | 0.41 | 0.27 |
| 2. Retinitis Pigmentosa | 0.005 | 0.049 | 0.71 | 13.2 | 100 | 25 | 50 | 0.36 | 0.24 |
| 3. Infantile Amaurotic Idiocy..... | 0.004 | 0.012 | 0.2 | 12.7 | 100 | 25 | 50 | 0.10 | 0.07 |
| 4. Congenital Glaucoma. | 0.008 | 0.063 | 0.9 | 8.4 | 60 | 15 | 30 | 0.45 | 0.30 |
| 5. High Myopia... | 4 | 5 | 20 | 32.5 | 100 | 25 | 50 | 10 | 6.6 |

## GENETIC PROGNOSIS OF THE PRINCIPAL AUTOSOMAL DOMINANT OCULAR DISEASES (CUENDET)

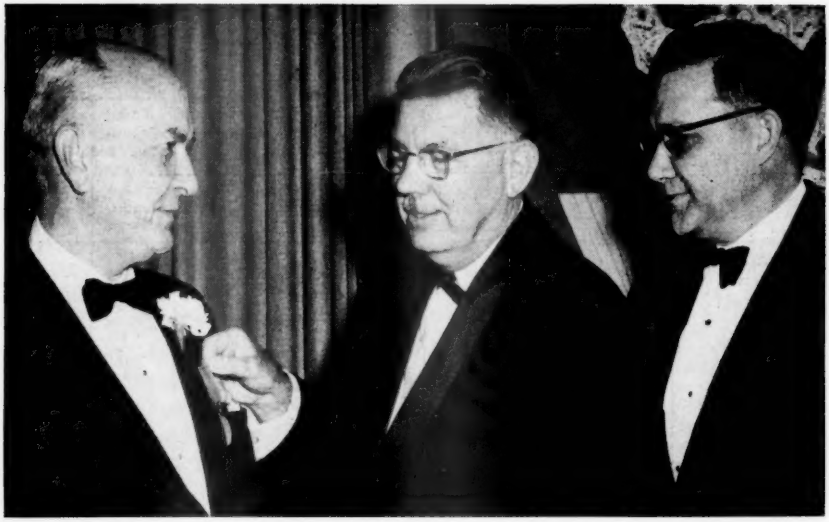
**Risk, in percentage, of having other affected children**

| Disease | Penetrance | Mother or Father Affected | | Mother and Father Affected | One Child Affected Parents Normal | Mother or Father and One Child Affected | One Grandparent or One Aunt or One Uncle Affected | A First Cousin Affected |
|---|---|---|---|---|---|---|---|---|
| | | No Consanguinity | Parents First Cousins | | | | | |
| 1. Congenital Central Cataract | 95 | 47.5 | 47.5 | 73 | 4.7 | 47.5 | 2.0 | 0.6 |
| 2. Optic Atrophy | 90 | 45.0 | 45.0 | 70 | 4.7 | 45.0 | 4.1 | 1.4 |
| 3. Aniridia | 83.5 | 42.0 | 42.2 | 67 | 4.2 | 42.0 | 5.9 | 2.2 |
| 4. Von Recklinghausen Disease | 70 | 35.0 | 35.5 | 60 | 3.5 | 35.0 | 8.1 | 3.2 |
| 5. Retinoblastoma | 60 | 30.0 | 30.8 | 55 | 3.0 | 30.0 | 8.6 | 3.5 |
| 6. Tuberous Sclerosis | 50 | 25.0 | 26.2 | 50 | 2.5 | 25.0 | 8.3 | 3.6 |
| 7. Von Hippel-Lindau | 50 | 25.0 | 26.2 | 50 | 2.5 | 25.0 | 8.3 | 3.6 |
| 8. Crouzon's Disease | 50 | 25.0 | 26.2 | 50 | 2.5 | 25.0 | 8.3 | 3.6 |
| 9. Colobomata of Eye | 50 | 25.0 | 26.2 | 50 | 2.5 | 25.0 | 8.3 | 3.6 |
| 10. Oxycephaly | 30 | 15.0 | 17.0 | 40 | 1.5 | 15.0 | 6.2 | 2.8 |
| 11. Apert's Syndrome | 10 | 5.0 | 7.7 | 30 | 0.5 | 5.0 | 2.4 | 1.15 |
| 12. Sturge-Weber Syndrome | 10 | 5.0 | 7.7 | 30 | 0.5 | 5.0 | 2.4 | 1.15 |

## GENETIC PROGNOSIS OF THE PRINCIPAL SEX-LINKED OCULAR DISEASES (CUENDET)

**Risk, in percentage, of having further affected children**

| Ocular Disease | Penetrance in Female | Father Affected No Consanguinity | Mother Affected No Consanguinity | Father Affected Mother and Father First Cousins Through Their Mothers | Maternal Grandfather Affected | Maternal Grandmother or Maternal Aunt or Maternal Uncle Affected | Paternal Grandparent or Paternal Aunt or Paternal Uncle Affected |
|---|---|---|---|---|---|---|---|
| 1. Congenital Nystagmus | 40 | □ —0.01<br>○ —40 | 52<br>22 | 13.0<br>47.7 | 50<br>20 | 25<br>10 | 0.01<br>0.008 |
| 2. Retinitis Pigmentosa | 0 | □ —0.001<br>○ —0 | 99<br>0 | 12.5<br>12.5 | 50<br>0 | 25<br>0 | 0.001<br>0 |
| 3. Choroideremia | 0 | □ —0.001<br>○ —0 | 99<br>0 | 12.5<br>12.5 | 50<br>0 | 25<br>0 | 0.001<br>0 |
| 4. Ocular Albinism | 0 | □ —0.001<br>○ —0 | 99<br>0 | 12.5<br>12.5 | 50<br>0 | 25<br>0 | 0.001<br>0 |



**FOR MERITORIOUS SERVICE IN BLINDNESS PREVENTION**—Dr. Derrick Vail, distinguished ophthalmologist, editor and teacher, is presented with the Leslie Dana award by Dr. Leslie C. Drews, board member of the St. Louis Society for the Blind, as Dr. B. Y. Alvis, president of the St. Louis Ophthalmological Society, looks on.

# 1959 Leslie Dana Medal Awarded to Dr. Derrick Vail

THE Leslie Dana Gold Medal, awarded annually for meritorious service in sight conservation and prevention of blindness was presented to Dr. Derrick Vail, well-known ophthalmologist of Chicago at a ceremony held in St. Louis on May 5. The occasion was a dinner sponsored by the St. Louis Society for the Blind and the St. Louis Ophthalmological Society at the Park Plaza Hotel. Dr. Leslie C. Drews, member of the board of directors of the St. Louis Society for the Blind, made the presentation.

Dr. Vail is recognized internationally as a teacher, editor and leader in advancing ophthalmological practice. He is professor and head of the department of ophthalmology at Northwestern University Medical School and editor-in-chief of the American Journal of Ophthalmology. He is the holder of the Outstanding Contribution Medal, section on ophthalmology, American Medical Association, 1956 and the Doyne Lecture and Medal, Oxford Ophthalmological Congress, 1957.

As a colonel in the U. S. Army in World War II, Dr. Vail received the Bronze Star and the Legion of Merit, *Medaille de Reconnaissance* and the Officer Order Crown of Belgium. He is past president of the American Ophthalmological Society, the American Academy of Ophthalmology and

Otolaryngology and the American Board of Ophthalmology.

In expressing his gratitude for the award Dr. Vail spoke of the formidable battles that have been won against blindness in the past 20 years "thanks to the aid and support of interested and devoted laymen such as the members of the St. Louis Society for the Blind and the National Society for the Prevention of Blindness."

"Our patients," he said, "are full of gratitude to you, and we ophthalmologists who are on the firing lines most humbly say thanks for your invaluable support. The war is still with us, but the enemy is gradually yielding and we are winning. Let us press on."

Dr. Vail is a member of the board of directors of the Illinois Society for the Prevention of Blindness, and for many years has given active support and guidance to the program of the National Society. He is a member of the board of editors of *Sight-Saving Review* and author of the popular book, "The Truth About Your Eyes," which has recently appeared in a second edition.

Dr. Vail is the 34th recipient of this award which was established by Leslie Dana, a public-spirited citizen of St. Louis who was deeply interested in furthering the sight conservation movement. Selection of five candidates is made yearly from a list suggested to NSPB by prevention of blindness agencies and heads of departments of ophthalmology at medical schools in the United States. The final selection of the awardee is made by the St. Louis Society for the Blind and the National Society.

Following the medal presentation Dr. Vail gave a report on the First Congress of the European Society of Ophthalmology held in Athens last April under the royal patronage of the King and Queen of Greece.

In declaring the Congress open King Paul told the delegates: "Some time ago my own sight was saved, thanks to your science and understanding."

The King, who had had a successful cataract operation a year before, added, "I believe that in a union of knowledge and human kindness lies the solution to many of our contemporary problems, not only of health, but also of politics, economics and human relations." After warmly welcoming the delegates, he added, "I know that you are not only distinguished scientists, but also great philanthropists who, in your service to mankind, combine your knowledge with human sympathy. Very often our sympathy for the sick leads us to forget the pain and agony felt by doctors in the fight to save their patients.

"I wish you to know that I personally appreciate fully the outstanding importance of modern medical practitioners, and that I consider them as an example of what might be achieved if only we learned to apply your high standards of values to our everyday life."

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### GUILD FELLOWSHIPS

Six new fellowships for residents in ophthalmology were awarded July 1 by the Guild of Prescription Opticians of America, Inc. Each fellowship amounted to $1,800, payable in monthly stipends over the period of a three-year residency.

Grants are limited to approved institutions where full three-year residencies may begin at any time during the year. Further information is available from Fellowships, Guild of Prescription Opticians of America Inc., 110 East 23rd Street, New York 10.

# LIMITED VISION

ALBERT E. SLOANE, M.D.
Boston, Massachusetts

ONE of the most satisfying experiences granted to us as ophthalmologists is the opportunity to make a patient again able to see. This experience is made more vivid when the patient has been under the impression that there was no way of making him again able to see and thus he sought no aid. And the same experience is flavored further in another dimension when the patient has been regularly under the care of capable physicians or agencies and no attempt has been made to raise his vision with other than ordinary spectacles or to refer him to a clinic where such work is done. Surely, there is need for clarification. These problems are not only related to patients and doctors but to the workers with the blind as well.

Let us consider each category: First, the ophthalmologist. It is commonplace knowledge that the majority of eye physicians do not work with low-vision aids. A principal reason is that it is the general impression that to do this work requires special and unusual skill. This assumption, however, is not true. Every ophthalmologist by virtue of his training *can* participate, and by his participation more people who can be helped can be reached. Inroads to solving this problem are being made by the concerted efforts of an ever-increasing number of physicians.

Education also demonstrates that expensive equipment is not necessary. In the past few years there have been a number of articles written on low vision testing, and all publications make the point of emphasizing that equipment need not be complicated, and skill is within the realm of any eye doctor. All one needs is the "will to help."

A second category includes persons who come in contact with the visually handicapped. They must be made aware that each afflicted person is entitled to a re-evaluation of his ocular situation. Too often, an unfavorable diagnosis made years ago is permitted to condemn a patient forever. It has been found that in a significant number of cases a careful refraction done with a fresh approach may offer much. It is up to the worker who has contact with such patients to arrange for check-ups. The patient resigned to his loss may not have access to such information.

Another point needing clarification is the attitude regarding use of the eyes. It was once held that people who had poor vision should not use their eyes more than absolutely necessary. The inference was that poor sight meant "weak eyes"—a term fortunately rarely heard now—and weak eyes became worse by reading. Therefore, to conserve the eyes one must be careful. And careful meant large print so as not to *strain* the eyes.

This very suggestive concept of *weak eyes* and *eye strain* has little basis in fact. The terms explain everything and yet nothing. Like the diagnosis of "torpidity of the liver," a "cold in my

An editorial reprinted from the *American Journal of Ophthalmology*, January, 1960.

back," they locate a discomfort and give a seemingly sound explanation—but they are not valid.

Eyes do not become weaker through use. In fact, reading is a skill that improves with use. It is normal and natural for a poor-sighted person and even a normal-sighted person who reads little or not at all to be uncomfortable when he again uses his eyes for this task. Surely, each succeeding week he will read better and better and more comfortably with practice; and the smaller type he learns to read, the easier will the average type be.

Sight-saving classes originally subscribed to the idea of larger type and more learning with the other senses than the eye. And it may seem inconceivable to dedicated teachers in this field to accept the present concept. This does not mean that their work has been in vain. Rather their efforts brought progress in better care, and, as more is learned, adjustments in philosophy become part of that progress. Twenty-five years ago it was incredible to think of getting a patient with a major operation out of bed within 24 hours; now it is unthinkable to keep him in bed for a week or two, as was former practice.

The child with poor vision is now being integrated more and more into regular classes. He is supported, when necessary, with visual aids and special books. An interesting observation, sufficiently repeated, warrants this next statement. Many children with very poor vision learn to read as quickly as those better sighted. It seems that this accomplishment feeds the ego of such a child, who probably reasons that here he has done with poor eyesight what his neighbor has done with normal eyes. Therefore, "if I had normal eyes, I'd do still better—I must be good." This assumption urges further education accomplishment and more often than not these youngsters are in the upper third of their classes. One suspects that education does not involve the eyes as much as has been believed. If the child with poor vision, who can be helped with a visual aid, after being given the opportunity of going to regular school, doesn't succeed, there is time enough for special classes.

Now, a few thoughts regarding the patient. In general, young persons do better than the older ones. Reading through an aid requires a technique different from ordinary reading. For one thing, the field of vision is smaller—less words are encompassed by the eye and one has to read in a mosaic pattern by piecing words together. This is not difficult but does require patience and practice and encouragement.

An Occupational Therapy Department is very helpful in guiding the patient through these early orientations. The patient must want to see—too many give lip service to the desire for sight but prefer to use this handicap to camouflage their greater desire for attention and unwillingness to accept responsibilities which recovered sight may threaten.

The patient must be realistic in his expectation from a device. He cannot walk wearing a strong telescope, he cannot read at an arm's length from the eye, his glasses have to look different and at times are conspicuous. The patient must realize that poor vision is not a crime of which to be ashamed; and special devices to help him are no symbols of shame and dishonor.

One can expect many old persons to require visual aids. Their use will permit many oldsters to enjoy life in spite of a degenerative eye condition. It is well to remember that old age may be likened to a model-T Ford—one cannot expect a smooth ride but one can be grateful that there is transportation. To be able to grow old counting the blessings rather than the blows is better than any retirement plan.

In regard to the actual visual aids themselves: there are many and they increase each month. They have different names, cost varying amounts of dollars, and they all resolve themselves into diopters. Thus, when it is determined that so many diopters are needed, one has recourse to many devices.

The ophthalmologist truly desiring to help his patient to see will add to his armamentarium the few simple devices necessary to do this work and not leave his responsibility unfulfilled.

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## PENNSYLVANIA'S POLICY ON VISION SCREENING

Following passage of Act 404 of the 1957 Pennsylvania General Assembly requiring that "each child of school age shall be given a vision test annually by a school nurse, medical technician, or teacher," the Department of Health in that state requested the Commission on Conservation of Vision of the Pennsylvania Medical Society to recommend standards for vision screening of school children. After a great deal of study the Commission made its report which was accepted by the Medical Society and published in the August 1958 issue of the Pennsylvania Medical Journal.

Based on these recommendations, the Pennsylvania Department of Health issued a statement to schools giving emphasis to the following:

1. Teacher-nurse observation for symptoms of eye trouble.
2. Inclusion of a convergence test in the physical examination of kindergarten and first grade children.
3. A test for visual acuity with the Snellen chart as the basic method of screening. Directions for giving the test are outlined.
   Criteria for referral: Inability to read three out of five or four out of seven symbols on the 20/40 line with either eye for children in kindergarten through grade three; inability to read the same number of symbols on the 20/30 line with either eye for children in grades four and above.
4. A test for farsightedness with convex lenses for children in the first and second grades. A +2.25 diopter lens is recommended and the child should be referred if he can read three out of five or four out of seven symbols on the 30 foot line with either eye.
5. No test for muscle imbalance is recommended other than the convergence test as stated above.
6. Special testing machines are not recommended.
7. Any school district may institute a vision screening program using different criteria or more comprehensive screening tests than outlined above but must have prior approval of the Secretary of Health and the program must be planned so that results may be computed.

# 1960 Revision of the Standard Classification of the Causes of Blindness

RALPH G. HURLIN, Ph.D., Chairman
Committee on Statistics of the Blind
National Society for the Prevention of Blindness

THE new revision of the Standard Classification of the Causes of Blindness of the Committee on Statistics of the Blind, published herewith, was adopted by the Committee at a meeting held early in September. The revision of the preceding edition had been under study by a subcommittee for more than a year. The changes, which were adopted as recommended by the subcommittee, include no major alteration of the classification scheme, which was true also of the revision of the 1940 edition adopted in1957.*

The Committee's classification was approved in principle for international use by the Pan American Association of Ophthalmology in 1948, and by the International Association for the Prevention of Blindness in 1950. The 1957 revision of the classification was presented and discussed at the meeting of the International Association for the Prevention of Blindness held at Brussels in 1958, and was then referred for study to a special committee. Suggestions have been exchanged with that committee in the course of the present revision, so that the new edition of the committee's classification will, it is expected, correspond very closely with the plan which will be recommended by the special committee for adoption by the International Association for the Prevention of Blindness at its next meeting.

Perhaps the most conspicuous of the changes now made is the new major division in the Etiology section, *Accidents, Poisonings, Violence*, which combines the earlier separate divisions, *Trauma* and *Poisonings*. It provides, as before, for dual classification of the cases belonging here, by External Cause (formerly termed Activity) and by Causal Agent. In making this change the Committee has followed the usage of the International Statistical Classification of Diseases, Injuries, and Causes of Death. The individual categories here remain substantially as they were before, except that in the classification by External Cause, 47.0 Act of violence has been added, and 46.0 Surgical or medical procedure, earlier included but omitted in the 1957 revision, has been restored.

In the Site and Type of Affection section, a new major division, *Conjunctiva*, has been added at the suggestion of the committee of the International Association. It will contain the cases of purulent ophthalmia of the newborn and of older persons and cases of other affections having their origin in the conjunctiva. These cases have presumably earlier been classified by site as affections of the cornea. Ophthalmia neonatorum is now omitted in the Etiological part of the classification, and 12.0 Gonorrhea will now contain all cases of this disease.

In the main the changes now intro-

* *Sight-Saving Review*, 27: 112. Summer 1957.

duced in the classification are relatively small adjustments of individual categories. A considerable number are verbal changes only, which improve terminology but are intended to affect the content of the category concerned not at all. Thus, 14.0 Meningococcal infection was formerly Meningococcal meningitis; 66.0 Complication of pregnancy was formerly Disease of pregnancy; and 143 Hydrophthalmos was formerly Megalophthalmos.

In four instances the classification has been simplified by combination of earlier separate categories which represented closely related diagnoses between which distinction is not sharply defined, so that their use by ophthalmologists may vary materially. These four instances are: 510, which combines the previous 510 Iritis and 520 Iridocyclitis and uveitis; 610, which combines previous 610 Retinitis or retinopathy and 620 Retinal hemorrhage; 650, which combines former 650 Retinitis pigmentosa and 670 Other retinal degeneration; and 710, which combines former 710 Optic nerve atrophy, 720 Optic neuritis, and 730 Papilledema. In one instance, 25.0 Toxoplasmosis, a single category has been subdivided to permit separate classification, as for syphilis, of prenatal and postnatal cases.

Other added categories deserving special mention are, in the Site and Type part: 121 and 122, which provide for distinction between cases of myopia for which detachment of the retina is specified and those for which detachment is not recorded, these categories replacing the former 140 Malignant myopia; 570 Sympathetic ophthalmia, which is re-inserted as a separate class of affections of the uveal tract, having been so included in the 1940 edition of the classification; and 980 Evidence insufficient for diagnosis, which is needed in the Site and Type part, as it is in the Etiology part, for cases in which the examining ophthalmologist finds insufficient evidence to indicate what factors caused blindness.

Directions for use of the classification, including discussion of individual categories that are likely to present problems in actual use, will be included in a new handbook for users of the scheme that is now being prepared and will be published by the National Society for the Prevention of Blindness.

The Committee on Statistics of the Blind, formerly a joint committee of the American Foundation for the Blind and the National Society for the Prevention of Blindness, is now a standing committee of the National Society, on which the Foundation has representation. The present membership of the committee is: Conrad Berens, M.D., Virginia S. Boyce, E. Myles Cooper, John W. Ferree, M.D., Franklin M. Foote, M.D., Marta Fraenkel, M.D., Milton D. Graham, Ph.D., Trygve Gunderson, M.D., Elizabeth M. Hatfield, M.P.H., Richard E. Hoover, M.D., Quentin R. Remein, and Ralph G. Hurlin, Ph.D., (Chairman).

# Standard Classification of Causes of Blindness—1960 Revision

## I. BY ETIOLOGY

### INFECTIOUS DISEASES

11.0 Diphtheria
12.0 Gonorrhea
13.0 Measles
14.0 Meningococcal infection
16.0 Scarlet fever
17.0 Septicemia
18.0 Smallpox
19.1 Syphilis, prenatal
19.2 Syphilis, postnatal
19.9 Syphilis, pre- or postnatal not specified
20.0 Trachoma
21.0 Tuberculosis
22.0 Typhoid fever
23.0 Rubella
24.0 Onchocerciasis
25.1 Toxoplasmosis, prenatal
25.2 Toxoplasmosis, postnatal
25.9 Toxoplasmosis, pre- or postnatal not specified
26.0 Brucellosis
27.0 Leprosy
28.0 Other infectious disease specified
29.0 Infectious disease, not specified

### ACCIDENTS, POISONINGS, VIOLENCE

#### A. External cause

40.0 Occupational activity
41.0 Military activity
42.0 Household activity
43.0 Play or sport other than occupational
44.0 Traffic or transportation other than occupational
45.0 Birth process
46.0 Surgical or medical procedure
47.0 Act of violence
48.0 Other external cause specified
49.0 External cause, not specified

#### B. Causal agent

.01 Chemical causing burn
.02 Radiation
.03 Other agent causing burn
.04 Firearm using explosive
.05 Fireworks
.06 Other explosive
.07 Airgun or slingshot
.08 Other sharp or pointed object
.09 Blow or fall
.10 Foreign body in eye
.11 Methyl alcohol
.12 Dinitrophenol
.13 Lead
.14 Quinine
.15 Oxygen
.18 Other causal agent specified
.19 Causal agent, not specified

### NEOPLASMS

51.0 Retinoblastoma
52.0 Melanosarcoma
58.0 Other neoplasm, type specified
59.0 Neoplasm, type not specified

### GENERAL DISEASES NOT ELSEWHERE CLASSIFIED

61.0 Anemia and other blood disease
62.0 Diabetes mellitus
63.0 Nephritis and other kidney disease
64.0 Vascular disease
65.1 Multiple sclerosis
65.8 Other disorder of central nervous system specified
65.9 Disorder of central nervous system, not specified
66.0 Complication of pregnancy
67.0 Nutritional deficiency
68.0 Sarcoidosis
78.0 Other general disease not elsewhere classified, specified
79.0 General disease not elsewhere classified, not specified

### PRENATAL INFLUENCE NOT ELSEWHERE CLASSIFIED

81.0 Genetic origin established
82.0 Genetic origin probable
88.0 Other prenatal influence not elsewhere classified, specified
89.0 Prenatal influence, not specified

### ETIOLOGY UNDETERMINED OR NOT REPORTED

91.0 Unknown to science
98.0 Evidence insufficient for diagnosis
99.0 No report on etiology

## II. BY SITE AND TYPE OF AFFECTION

### EYEBALL IN GENERAL

110 Glaucoma, excluding infantile
121 Myopia, detachment of retina specified
122 Myopia, detachment of retina not specified
130 Panophthalmitis and acute endophthalmitis
141 Albinism
142 Anophthalmos, excluding surgical
143 Hydrophthalmos (infantile glaucoma)
144 Microphthalmos
145 Aniridia
146 Coloboma, any part, excluding surgical
147 Multiple congenital anomalies
148 Other congenital anomaly specified
149 Congenital anomaly, not specified
150 Disorganized eyeball (atrophic globe, phthisis bulbi)
180 Other general affection of eyeball specified
190 General affection of eyeball, not specified

### CONJUNCTIVA

211 Purulent ophthalmia of newborn (ophthalmia neonatorum)
212 Purulent ophthalmia other than newborn
280 Other affection of conjunctiva specified
290 Affection of conjunctiva, not specified

### CORNEA

311 Interstitial keratitis
312 Phlyctenular keratitis, including keratoconjunctivitis
313 Ulcerative keratitis, including trachoma
314 Sclerosing keratitis
318 Other keratitis, type specified
319 Keratitis, type not specified
320 Corneal dystrophy, degeneration
360 Keratomalacia
370 Keratoconus
380 Other affection of cornea specified
390 Affection of cornea, not specified

### LENS

410 Cataract
420 Dislocated lens
480 Other affection of lens specified
490 Affection of lens, not specified

### UVEAL TRACT

510 Iritis, iridocyclitis or uveitis
530 Kerato-iridocyclitis or sclero-iridocyclitis
550 Choroiditis
560 Chorioretinitis
570 Sympathetic ophthalmia
580 Other affection of iris, ciliary body or choroid specified
590 Affection of iris, ciliary body or choroid, not specified

### RETINA

610 Retinopathy, including retinitis and lesions of retinal vessels
630 Retrolental fibroplasia
640 Detachment of retina
650 Tapetoretinal degeneration and allied conditions, including retinitis pigmentosa
660 Macular degeneration
680 Other affection of retina specified
690 Affection of retina, not specified

### OPTIC NERVE, OPTIC PATHWAY, AND CORTICAL VISUAL CENTERS

710 Optic nerve atrophy, optic neuritis or papilledema
730 Other affection of optic nerve specified
740 Affection of optic nerve, not specified
750 Lesion of optic pathway or cortical visual centers

### VITREOUS

810 Vitreous hemorrhage
880 Other affection of vitreous specified
890 Affection of vitreous, not specified

### SITE AND TYPE INDEFINITE OR NOT REPORTED

940 Amblyopia ex anopsia
950 Congenital nystagmus, not elsewhere classified
980 Evidence insufficient for diagnosis
990 No report on site and type of affection

# ATTITUDES OF EDUCATORS TOWARD THE VISUALLY HANDICAPPED

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**A recent study suggests that educators in general reject the idea of teaching children with visual impairment, possibly because they know little about this field of work and its rich rewards.**

THOSE who have chosen to work with the handicapped have implied that whatever they, more than others, have received in health, ability and self-fulfillment has not been taken for granted. They believe, though they may never have stated it, that they ought to pay the price for such gifts, and they want to. Thus we find that individuals who work with the handicapped have highly positive, acceptant attitudes toward these children, especially those in certain categories of exceptionality with whom they are most closely associated in their daily work setting.

We would not expect, however, that all who work with the visually handicapped are equally acceptant of or empathic with their charges. Neither would we expect them to be equally acceptant of children representing other types of disability. We perhaps would not be surprised to discover that some teachers of children with visual disorders are more acceptant of other groups (including the non-handicapped).

If there is such variability in attitudes among specialists one cannot help wondering about the attitudes of those adults who are in frequent contact with the children but who do not have the advantage of special knowledge, much less the pattern of motivations and attitudes which have stirred the specialists in the direction of working with the visually impaired. The wonderment assumes a special cogency in regard to public school situations where such pupils interact with adults having meagre knowledge of the problems associated with visual disability.

It can be inferred, on the basis of common sense and experimental evidence, that children who feel accepted or loved are more successful socially and educationally than those who feel rejected. The child's self-perception derives principally from the attitudes he believes others have toward him. In general, children who are victims of rejection, especially if they experience outright disparagement, correspondingly endure embarrassment, and lowered self-esteem[2] and often have a greater susceptibility to behavior disorder.[3, 6] The attitudes of the tending elders, then, become crucial in terms of their effects upon the child's self-image and his consequent mode of adjustment to educational and social developmental tasks.

How, then, are visually handicapped children perceived, at least in comparison with other types of exceptional children, by persons not expert in the area of visual problems who may participate in the majority of the child's interpersonal relationships in his educational setting? Being perceived as a member of a stigmatized group may be the critical determinant as to whether or not a child who is merely disabled becomes truly handicapped. From such considerations the following research procedure evolved.

### Objective of the Study

This study was designed to measure by a rating-scale the attitudes of several groups of educators toward exceptional children. The problem may be presented in the form of several questions: (1) Do different groups of childhood workers vary in attitude concerning variously handicapped children? (2) Within each professional group are certain categories of exceptional children more apt to be accepted or rejected than other categories? (3) To what degree do the several groups differ or correlate in their attitudes toward the exceptional?

Rating scales were administered to persons in courses at the School of Education and the Graduate School of Boston University, and to students enrolled in Harvard-Boston University extension courses taught by the author in Massachusetts, Maine, New Hampshire and Rhode Island. About 80 per cent of the professional workers were engaged full-time in educational settings, attending class part-time. All of the freshman teachers-to-be were full-time students at Boston University.

Respondents included 100 elementary classroom teachers, 32 elementary principals, 46 special educators (school guidance workers, nurses, and special class teachers), 100 freshman teachers-to-be and 31 speech clinicians, a total of 309 participants.

TABLE I

Mean Rank-Order of All Respondent Groups to the Items "*Most* Prefer to Teach" and "*Least* Prefer to Teach"

| Item Category | *Most* Prefer to Teach | | | | | *Least* Prefer to Teach | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| | Responding Group | | | | | | | | | |
| | C.T.* | S | P | F | S.C. | C.T. | S | P | F | S.C. |
| Visual | 7 | 5.5 | 7 | 8 | 7 | 2 | 5 | 1 | 1 | 2 |
| Slow Learner | 5 | 3.5 | 2 | 6 | 4 | 4.5 | 7.5 | 6 | 3 | 4.5 |
| Emotional | 3 | 1.5 | 4.5 | 4 | 2.5 | 6.5 | 5 | 3.5 | 5 | 6 |
| Physically Handicapped | 3 | 1.5 | 3 | 1 | 5 | 6.5 | 7.5 | 7 | 6.5 | 4.5 |
| Hearing | 6 | 7 | 7 | 7 | 2.5 | 3 | 2 | 2 | 3 | 7 |
| Gifted | 1 | 3.5 | 1 | 2 | 6 | 8 | 5 | 8 | 6.5 | 3 |
| Speech | 3 | 5.5 | 4.5 | 5 | 1 | 4.5 | 3 | 5 | 3 | 8 |
| Delinquent | 8 | 8 | 7 | 2 | 8 | 1 | 1 | 3.5 | 8 | 1 |

* Key to abbreviations:
C.T.—Classroom Teachers (N:100)
S.—Specialists (N:46)
P.—Principals (N:32)
F.—Freshman Teachers-to-be (N:100)
S.C.—Speech Clinicians (N:31)

**TABLE II**

**Mean Rank-Order of All Respondent Groups to the Items "Know *Most* About" and "Know *Least* About."**

| Item | Know Most About | | | | | Know Least About | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Category | Responding Group | | | | | | | | | |
| | C.T. | S | P | F | S.C. | C.T. | S | P | F | S.C. |
| Visual | 7 | 4.5 | 7 | 7 | 8 | 1 | 5 | 1 | 1.5 | 1 |
| Slow Learner | 2 | 1 | 1.5 | 4.5 | 4 | 5 | 8 | 7.5 | 5 | 5 |
| Emotional | 3 | 2 | 4 | 4.5 | 3 | 6 | 7 | 4.5 | 4 | 6 |
| Physically Handicapped | 5 | 3 | 4 | 2.5 | 6 | 3.5 | 6 | 6 | 6 | 3.5 |
| Hearing | 6 | 6 | 8 | 8 | 2 | 7 | 2 | 2.5 | 1.5 | 7 |
| Gifted | 1 | 7.5 | 1.5 | 2.5 | 5 | 3.5 | 1 | 7.5 | 7 | 3.5 |
| Speech | 4 | 4.5 | 6 | 6 | 1 | 8 | 4 | 2.5 | 3 | 8 |
| Delinquent | 8 | 7.5 | 4 | 1 | 7 | 2 | 3 | 4.5 | 8 | 2 |

All rankings were done between March and December, 1957. The ranking scale was adapted from one used by Kvaraceus[4] whose similar study was based on a sample of 83 child workers. In the present study, scales usually were administered in group situations (classes). Eight general categories of exceptionality were listed on the ranking sheet with no additional definition of the terms: (1) visual handicaps; (2) mentally retarded or slow; (3) emotionally disturbed; (4) physically handicapped (crippled); (5) hearing handicapped; (6) gifted and talented; (7) speech disordered; (8) delinquents (overt-aggressive type).

Each respondent was asked to place the categories of exceptionality in a rank-order of preference in accordance with each of the following questions:

a. Which type of exceptional child would you *most prefer* to teach?

b. Which type of exceptional child would you *least prefer* to teach?

c. Which type of exceptional child do you feel you *know most about?*

d. Which type of exceptional child do you feel you *know least about?*

Approximately 90 per cent of the responses were anonymous in order to avoid the possibility of distortion of attitude-responses if identification could be made.

### Order of Preference

Table I presents the average ranks given by each of the responding groups. The elementary classroom teachers preferred rather definitely the gifted group. The specialists most preferred to teach the emotionally disturbed and physically handicapped. Principals, while agreeing with teachers in naming the gifted as first choice, indicated that slow learners were their next preference. The freshmen teachers-to-be most preferred to teach the physically handicapped, followed by the gifted and delinquent. Speech clinicians, as expected, most preferred working with children having speech disorders, followed by those with emotional or hearing problems.

In relation to the category *least prefer to teach*, the classroom teachers

named first the delinquent and next the visually handicapped. Specialists were much less rejecting of the visually handicapped in relation not only to the teachers but to the other respondents as well. Principals designated children with visual impairments as the group they would least prefer to teach, as did freshmen teachers-to-be. Speech clinicians signified that the visually handicapped were next to least preferred, being superordinated only by the delinquent. In general, the visual category was least preferred by the respondents as a group when compared to all other categories of exceptionality except the delinquent.

#### Best Known Categories

The second question asked the respondents to rank-order the categories of exceptionality in terms of which types they felt they knew most and least about. Table II presents the results. The classroom teachers showed that they knew most about gifted, slow learning and emotionally disturbed children, in that order. The specialists listed slow learners, emotionally disturbed and physically handicapped. The principals designated slow learners and gifted children about equally; the freshmen named the delinquent, gifted and physically handicapped. The inclination of the freshmen to lean toward the delinquent might result from their being surrounded today by so much thought and action having to do with the problem of delinquency. Speech clinicians, as seems logical, believed that they knew most about the speech, hearing, and emotionally handicapped.

Table II discloses that all of the responding groups except the specialists felt that they knew less about the visually handicapped group than about any other considered. Again, analysis of the responses of the groups combined reveals that the visually handicapped group is one about which these respondents felt least or nearly least knowledgeable. Although other determinants most certainly are operant, there may be a relationship between how much a person knows or thinks he knows about a specific handicap, and the feelings or attitudes he has toward that condition. A moderate trend is found indicating that the more a person feels he knows about a handicapping condition the more inclined he is to want to work with children who have it.

#### Conclusions and Considerations

On the basis of the procedures and findings reported, the following conclusions and considerations seem reasonable:

First, in comparison with other areas of exceptionality children with visual defects might be regarded as second-class citizens, seemingly on an equal level in the attitudinal hierarchy with overt-aggressive delinquents.

Second, there is at least a positive trend-correlation between how much a person thinks he knows about a specific area of exceptionality and his attitude of acceptance or preference concerning it. The great majority of the respondents participating in this study not only placed the visually handicapped child on the rejection end of the attitudinal continuum but also signified that they knew very little about these children in comparison to those having other types of disability.

Third, many questions present themselves: How great are the obstacles placed by society, as represented by the 309 participating educators, in the path of the child already burdened with a serious obstacle to fullest self-realization? How much do the attitudes revealed here stem from emotionalized stereotyping rather than deep understanding? Do educators feel frustrated, fearful, resentful, embarrassed, or anxious in relation to the child with a visual disorder? Do attitudes of rejection render him, in the deepest sense, a multiply-handicapped child? Do children reveal similar attitudes toward visually handicapped children? How much does a visually impaired child's self-concept correlate with others' perception of him, when the two variables are analyzed both as cause and effect?

Our answers to such questions are little more than tentative at present, much research being needed in order to understand the effects of interpersonal dynamics upon the child's eventual social and educational adjustment. Recent years have brought partial breakthroughs on research horizons.[1] In addition, an increasing number of survey and observation courses on exceptional children are being offered in institutions of higher learning; in many states at least one such course is required of all persons training to become classroom teachers. In-service training programs dealing with the problems and potentials of visually impaired children need to be increased greatly.

The distribution of information designed to enlighten the public concerning the visually handicapped (not to mention the recruiting of young teachers) must continue at an intensified pace. Cooperative meetings of specialists in the field of visual disorders and allied professional groups are helpful.[5] Any procedures that will meaningfully aid all to better understand the individual with a visual impairment need to be used. The problem is complex, although the operational premise is (perhaps deceptively) simple: It is that knowledge fosters comfort. The more one feels knowledgeable about a disability, the more inclined he is to move toward, be with, work with persons having that disability; granted that the bedrock determinant of rejecting or accepting attitudes will be the emotional dynamics of the reacting one, rather than the amount of information that person possesses. While in human relationships attitudes are more important than facts, if sound, positive attitudes are to evolve they will do so more readily when there is familiarity with the facts.

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# INSTRUCTIONAL MATERIALS AND PROCEDURES FOR THE PARTIALLY SEEING

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**An itinerant teacher describes her daily routine and the program under which she gives special help to visually handicapped children enrolled in regular classrooms.***

SINCE an itinerant teacher has no classroom of her own her car is always loaded to capacity with the tools of her trade. She must always be prepared for the many needs which are certain to arise.

Among the important items I carry is a box filled with library books, carefully chosen for clear, well spaced print, good margins and colorful, interesting pictures. They cover a variety of subjects and are for children in grades one through eight.

Appropriate basic school books for children who are partially seeing are not now the problem in California that they once were. Through special legislation passed several years ago our state series books are furnished in large type by the state department.

Large-type books are available from American Printing House for the Blind and Stanwix House as well as from local transcribing groups. National Aid to the Visually Handicapped, a voluntary transcribing group, has quite a list for distribution anywhere in the United States.

### Tests in Large Type

We use large-type tests that are most helpful in ascertaining strengths and weaknesses of children who perhaps did not do well in the regular group tests administered in the classroom. This often happens because of time limits and small, unsuitable print. Use of large-type tests gives us added information regarding the child's educational needs which can be most helpful to all concerned.

Not all children who are partially seeing require large type. Some even see small print better than large print, if it is dark and well spaced on the page. The teacher finds her clues as to type size by experimentation plus reference to the child's medical eye report. This experimentation can be fun for both teacher and child if carefully planned. I have found at times very little correlation between the way the eyes function at the far and near point.

In another box I arrange my teacher's manuals for the various subjects and grades. There are two kinds of easels and five different types of small magnifying devices. A portable pro-

* Presented at the 38th Annual International Convention of the Council for Exceptional Children: Panel on Instructional Materials and Procedures for the Partially Seeing. *Chairman*—Helen Gibbons, NSPB consultant in education.

jection magnifier has proved useful to some students.

Within the last five years many excellent new magnifying devices have been put on the market, and our office has accumulated quite a sampling of them. We feel this is necessary since choosing an appropriate magnifier becomes almost as individual a problem as the fitting of glasses. What works for one child will not necessarily work for another. Sometimes, none of the devices help.

A third box in my car has games and puzzles that have been helpful over the years. Of course they are all chosen with ease of seeing and high interest level kept well in mind. Most of them I have made myself, using a large-type typewriter or manuscript printing and pictures cut from books, magazines and catalogs. The typewriter, as well as a large-type dictionary, large atlas and tape recorder are necessary in order to be adequately prepared for the day's work.

#### Arithmetic and Language Aids

A basket contains my best helps for arithmetic and language development: small cars and dolls of various colors and sizes for matching and counting, cards of assorted buttons, rubber washers, measuring spoons, a nest of small cups and even tongue depressors and colored cardboard tabs for counting and grouping.

Tactual and manipulative articles, important for all children, are doubly so for those with serious visual impairment.

My green file case has an interesting collection of pictures mounted on tagboard. These are used for language development and as inspiration for story-telling or writing. There are loose-leaf notebooks and several reams of cream-colored paper, and in the glove compartment large soft lead mechanical pencils and erasers.

The partially seeing children are registered in regular classrooms in their own schools. They are seen by me for individual and concentrated work one hour each week. I work with administrative permission and under the regular teacher's direction based on the student's immediate educational needs. I share with the teacher the knowledge I have regarding proper seating, lighting, use of special equipment and materials, and the unique needs of the child.

The plan requires real teamwork. The services, in the final analysis, are ones of reinforcement and enrichment, to make educational opportunity for partially seeing children equal to that of their classmates.

#### A Look at the Children

Let us now take a look at the children. The first stop might be Northmead School.

Debora S., in the second grade, has no vision in her right eye; 20/200 in her left (retrolental fibroplasia, myopia, nystagmus). Debora is legally blind but uses the vision she has so effectively that she appears, at this time, to be able to use print as her tool for learning. Writing and copying work from the board are the biggest problems. She does excellent work which compares favorably with the top third of the group, is well adjusted socially, emotionally and educationally. She is just beginning to realize what it means to have a visual handicap.

During this visit I examine and correct Debora's papers, given to us by

the teacher when they have red pencil marks; help her to write creative stories; work on arithmetic and practice letter formation; try reading books with various size type chosen by Debora from my car.

During a coffee break I talk informally with the teacher and later call at Debora's home to discuss with her mother plans for creating awareness of the child's safety problems.

At Wakefield School in Turlock I call on Jimmie H. in the fourth grade. He has vision of 20/70 in his right eye, 20/200 in his left (strabismus—post operative). He holds his head at an odd angle when copying from books or the chalkboard. His present problems are not really serious, and our work procedures vary according to immediate needs. Following Jimmie's operation he had special problems in work preparation but now he is very much a part of the group, an average student, cheerful and happy.

On this visit we work on reading comprehension, written answers to questions and use of the dictionary.

Following lunch I confer with Jimmie's teacher, then drive to Julien School in Turlock where two partially seeing children are enrolled in the fourth grade.

#### Michael's Program

Michael has congenital glaucoma, with vision of 20/200 in both eyes. His glaucoma has been kept under control with drops and his doctor does not recommend that he learn braille. Michael has had individual assistance for four years, has special problems in reading, spelling and writing and in social adjustment. He appears to be improving, and his near vision enables him to read fourth-grade-size print at three inches. Frequent mistakes in his copy work are possibly due to inattention and a slight hearing loss, coupled with the low visual acuity.

On this visit I work with Michael on certain problems suggested by the classroom teacher: typing, spelling, social studies questions, and use of the dictionary. I concentrate on creating a deliberate and habitual listening pattern. There are times when I feel that Michael could profit by using braille as a learning tool, although he does acceptable work and gets his assignments finished. He appears to be very intelligent, loves arithmetic and needs no special assistance in this area.

#### Tommy's Progress

Tommy, also in grade four, has vision of 20/200 in both eyes, is myopic and has required individual assistance for three years. When he entered school he and his family believed that he would be blind by the time he was 12. (He is now legally blind.) He has had emotional as well as educational problems, but cooperative effort to overcome them has been most successful.

Conferences have been held with Tommy's parents to encourage maximum use of the sight he possesses, of course with doctor's approval. All possible techniques have been used for his educational and emotional growth. His progress has been amazing. Recent tests in regular size type taken with his grade group show achievement to be from one to three years above grade level. He types very well from dictation; also types letters and stories with only occasional help in spelling a word. Spelling in his C.A.T. test at the end of this term showed 7.7. He does not use large type.

**Office Administration**

At my office in Modesto I maintain a busy schedule. This includes correspondence with national and state agencies and consultants, with transcribing groups and fellow workers. There are frequent personal and telephone conferences with doctors, nurses, parents and general consultants. To achieve professional growth I attend many meetings and study trends in reading, writing and other subjects, as well as in the field of the visually handicapped. I strive constantly to evaluate the effectiveness of my services to these children who are partially seeing.

One of my favorite quotes is from "The Pursuit of Excellence," Special Studies Project Report V, Rockefeller Brothers Fund:

"If we are to do justice to the individual we must seek for him the level and kind of education which will open *his* eyes, stimulate *his* mind and unlock *his* potentials. We should seek to develop many educational patterns—each geared to the particular capacities of the student for whom it is designed."

If we do this we make the pursuit of excellence in education possible for all children including, of course, those with visual problems.

## UVEITIS RESEARCH

A three-year research project in the etiology, diagnosis and treatment of uveitis will be initiated this year at the Institute of Ophthalmology of the Columbia-Presbyterian Medical Center in New York. The Institute's director, A Gerard DeVoe,M.D., will supervise the study.

Uveitis is reported to be the cause of 12 per cent of all blindness in this country, and many of its aspects are not understood.

## TEACHER TRANSFORMS BLIND INDIAN BOY

What a dedicated special teacher can do with a problem-child-plus is suggested in a letter to NSPB from Ralph L. Distad, supervisor of the Division of Special Education of the South Dakota schools. His story concerns a young Indian boy, legally blind, a waif twice expelled from the State School for the Blind. This potential delinquent was placed in a school for exceptional children in Pierre, and his teacher was Katherine Moses. It was really this woman who worked a miracle on the rebellious boy, though of course others helped.

"The metamorphosis of this child is amazing," Mr. Distad wrote. "He is now in High School—goes about without a cane—uses the library facilities. His grades are good, attitude is fine, attendance perfect. In short, he is a fine boy and student. Someone helped him—I can only suggest Miss Moses as the figure most prominent in the teamwork."

## TEACHING OPPORTUNITY

A position is open in the Kalamazoo Public Schools for a teacher-counselor for the visually handicapped—an intinerant service to blind or partially seeing children in regular classes.

Responsibilities: studying pupils, interpreting needs to classroom teachers, counseling child and family, providing adopted tools and materials, liaison with community agencies, instruction in braille, etc.

Opportunity to teach at local university —"Problems in education of Visually Handicapped." Six weeks of summer school employment also possible.

Inquiry should be directed to Kingsley Sears, assistant director of personnel, 1220 Howard Street, Kalamazoo, Michigan.

# Ceylon's Giant Strides in Eye Health

AT A recent meeting of the National Society's Board of Directors Mrs. Edward Forman, a vice-president, described an interesting visit in Ceylon during a world tour. In Colombo she met Dr. P. Sivasubramaniam, vice-president of the National Association for the Prevention of Blindness in Ceylon, who has corresponded with NSPB in the past and has translated our publications for use in his work.

As a background for understanding some of the medical problems in Ceylon, Mrs. Forman said that the island with its population of ten millions has been independent since 1948, but is making good use of the splendid health service organized by the British. "All along the 70-mile drive to Kandy we saw evidences of this," she said. "Health service clinics, dispensaries and surgeries are located not too far apart, so it is possible for people to walk to them."

### Current Needs

Dr. Sivasubramaniam, who finished his medical training in England and is ophthalmologist at the Victoria Memorial Eye Hospital, told Mrs. Forman that lack of medical literature in Singhalese (now the official language) and the dearth of eye specialists are two great problems in Ceylon. There are only a dozen ophthalmologists on the island, he said, and they are so overburdened that recently two older men who had retired have come back on part-time to help out. Meanwhile, four young men have been sent to England for ophthalmic training.

Mrs. Forman brought back with her a copy of Dr. Sivasubramaniam's brochure, "The Problem of Blindness in Ceylon" which presents in detail the situation he discussed with her in Colombo. This valuable presentation was made before the Ceylon Association for the Advancement of Science upon his election as president of the medical section. He mentioned the building of a first-rate Institute of Ophthalmology beside the Eye Hospital, and the reorganization of the ophthalmic services of the country as evidences of awakening interest in eye health.

### Causes of Blindness

Among the problems special to the island he mentioned the practice of mothers putting children with infantile diarrhea on a diet of soda pop, as advised by quacks. At the end of 40 to 50 days the child is either starved to death or develops keratomalacia. Another preventable cause of blindness, he said, was trauma caused by needless industrial accidents, carelessness in the household, but especially the wanton destruction of eyes by fireworks at the numerous festivals of the country. These "pseudo-Chinese" firecrackers contain powdered aluminum and fragments of metal, and are largely responsible for the high percentage (about 13) trauma has reached as a cause of blindness. Another special problem is epidemic purulent conjunctivitis during the hot dry months, probably carried by the common fruit fly. Too few of the victims of these epidemics get prompt treatment, "believing this disease to be an ordeal inflicted by some angry god."

**Blindness Rate**

Statistics vary as to the actual number of blind persons in Ceylon, but the doctor put the blindness rate at between 150 and 300 per 100,000 of population. To get a reliable sample, he analyzed a series of 1,391 patients attending the eye clinics at Jaffna, Kandy and Colombo. The blindness percentage by age groups was 1.7 in children from one to four years of age, 6 in children five to 14, running up to 42.1 in the group aged 60 and over, when cataract, Ceylon's chief cause of blindness, became a problem. After cataract the causes of blindness in diminishing order were corneal affections, glaucoma, trauma, optic atrophy, myopia and uveitis. Among the real triumphs in conquering eye disease, Dr. Sivasubramaniam demonstrated the tremendous decline in blindness caused by uveitis and corneal disease.

The program this dynamic young ophthalmologist outlined for future work included a network of eye care centers over the island and mobile units for surgery and education of the people in eye care. As he emphasized in his conversation with Mrs. Forman, a campaign of public education in corneal transplants is of paramount importance. Lack of donor eyes is holding up the necessary surgery, since few people know that enucleation of eyes from the dead has been legal since 1955, and many are prevented by religion or superstition from understanding the miracle of keratoplasty. Establishment of an eye bank is high on the "must" list of Ceylon's medical leaders.

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## Nurses Attend Georgia Institute

MEDICAL, community and industrial aspects of eye health were discussed at an institute held in Atlanta, Georgia February 29 and March 1, 1960 under the joint sponsorship of the Emory University School of Nursing, the Georgia Society for the Prevention of Blindness and the National Society. The sessions, attended by student nurses and graduate nurses serving in various fields, were held in the auditorium of Emory University Hospital.

Mrs. Evelyn Rowe and Mrs. Barbara Harris, professors in the School of Nursing, acted as presiding officers on successive days, and the address of welcome was given by Dean Mabel Korsell. Four faculty members of the Emory University School of Medicine presented the medical lectures. Dr. Mason Baird, chairman of the professional advisory committee of the Georgia Society, discussed eye abnormalities in children; Dr. Gerhard Brecher explained eye physiology and refractive errors. The subject, "Eye conditions of the middle years and over" was presented by two Emory ophthalmologists, Dr. M. Hobson Rice and Dr. J. Jack Stokes.

As nurse consultant of the National Society, Mrs. Florence Cunningham played an active part in all sessions. Her formal lecture in the opening session was on "Needs in the Prevention of Blindness," in which she described the expanding field in which the National Society has functioned for half a century. On the second day of the

institute she was moderator of a panel on community services for eye health. Speakers in the panel were W. B. Gaines of the Georgia Division of Vocational Rehabilitation; Margaret Bynum, consultant, Services for Exceptional Children of the State Department of Education; Mrs. Mary Marsh, executive director, Foundation for Visually Handicapped Children; Carolyn Bullard, administrative assistant, Field Social Services, Georgia State Department of Public Welfare; Stella Opem, regional consultant nurse, Georgia State Department of Health, and Mrs. Louise Peacock, executive director of the Georgia Society for the Prevention of Blindness. The panel participants explained in detail what their agencies accomplish in helping the visually handicapped in Georgia.

The afternoon panel on eye health in industry had as moderator Gwen Dekle, R.N., occupational health nurse consultant, Georgia Department of Public Health. Participants were Mrs. Cunningham and James E. O'Neil of the National Society; Dr. William T. Edwards of Emory U. School of Medicine; Judge Alta Peterson, deputy director, State Board of Compensation; Mrs. Hazel Carswell, R.N., and George T. McIntyre of the J. P. Stevens Company, and Edward Stratton, safety engineer of the Mutual Insurance Company of Atlanta. The representatives of the Stevens Company described a comprehensive system of vision screening and protective eye equipment, including prescription lenses, furnished by the company and faithfully worn by the employees.

During the sessions several NSPB films were shown; a case presentation of a patient with cataract was offered, by Elizabeth Mills, head of the medical and surgical department, Emory University School of Nursing, and a skit, "A Public Health Nurse Finds a Glaucoma Patient." Nurses attending the institute expressed appreciation of learning much about the eyes that would be valuable in their future work.

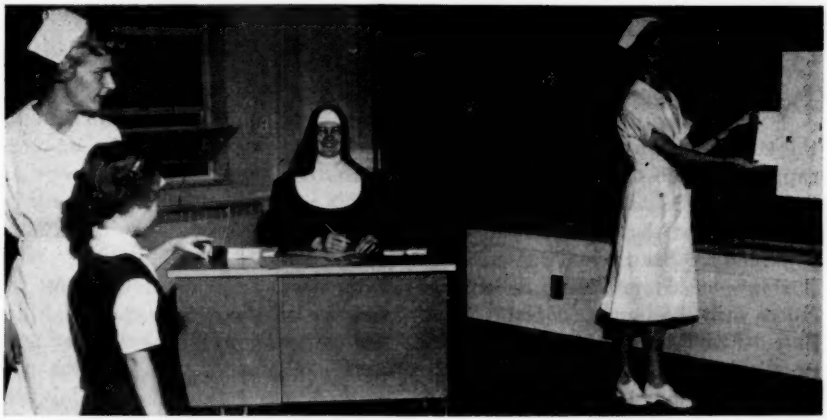
## STUDENT NURSES SCREEN CHILDREN

Vision screening as part of the nursing school curriculum was initiated in the St. Louis area during the 1959–60 school year in what is believed to be the first instance of the kind. The Lighthouse for the Blind and St. Louis Society for the Blind inspired the project, which was carried out by sophomores of the St. Louis University School of Nursing.

After preliminary training, 36 student nurses screened 5,679 children in 10 parochial schools, using the standard Snellen method. All doubtful cases were rescreened, and 545 pupils were referred for eye care. In the referred cases the observations of the child's teacher were part of the record made by the student nurses.

A good deal of educational work was included in the program. Several of the schools kept no health records, and the student nurses and their instructors were able to effect a reform in this regard, supplying the proper forms issued by the state department of health. Lectures were given the pupils on eye health, and arrangements were made for talks in the PTA of each school by Robert A. Roberge, director of Prevention of Blindness of the Lighthouse—St. Louis Society.

The student nurses, who came from



Sophomores of St. Louis University School of Nursing conduct vision screening in a parochial school.

many states of the Union, were enthusiastic about the project, and it is believed that vision screening courses will continue to be given in the University School, and will be introduced to other schools of nursing in St. Louis.

## EYE CONDITIONS LINKED TO SYNDROME

Two Johns Hopkins physicians have found that severe pathologic conditions of the eye are commonly associated with Pierre Robin syndrome (abnormally small jaw and cleft palate). *Scope Weekly* reports that the finding was the result of a study that began when two babies with this syndrome were referred to Dr. J. Lawton Smith, resident ophthalmologist at the hospital, because of serious eye problems. One had congenital glaucoma and the other a detached retina.

Working in collaboration with Dr. Fred R. Stowe, assistant resident in pediatrics, Dr. Smith was able to locate 19 of the 39 patients with the syndrome who had been treated at the hospital from 1940 to 1960. Nine had evidence of severe eye complications. In addition to glaucoma and detached retina there were six instances of squint caused by the imbalance of extraocular muscles, and one of severe myopia caused by misshapen eyeball.

These studies indicate that a thorough eye examination should be made in all cases of Pierre Robin disease.

## DRIVERS' VISION

Low-slung cars reduce road visibility, warns Clyde E. Lee, assistant professor of civil engineering at the University of Texas. Today the average driver's eyes are less than four feet above the pavement while most roads have been designed using the recommended 4.5 feet as the average height of the driver's eyes. Mr. Lee reported to a meeting of the Highway Research Board that this safety threat can be corrected through minor changes in road design.

*Today's Traffic* reports that some drivers who have switched from glasses to contact lenses are finding that their driving permit restriction to drive "only while using proper glasses" is not being fulfilled if they drive while wearing their contacts.

# Elks Aid Unique Oregon Service

NOW beginning its eleventh year, an eye health program unique in this country serves the visually handicapped children of Oregon. It is conducted by the Department of Ophthalmology at the University of Oregon Medical School in Portland and the Oregon State Blind School in Salem with the support of the Oregon State Elks Association. This support includes contributions averaging $12,000 annually, gifts of equipment by the individual lodges, and active publicizing of the program in order that no child with an eye problem need go without expert medical attention.

With the backing of the Elks Association the Medical School has been able to develop a triple program of teaching, research and free treatment of children whose parents cannot afford this medical expense. In its teaching activity the school gives graduate physicians a three-year course in ophthalmology, with one year devoted to the study of eye diseases in children. Twenty specialists now practicing have completed this course. The Medical School also trains medical and nursing students and ancillary personnel such as technicians so that they may provide better ophthalmic services to Oregon communities.

### Research Program

The research part of the program includes both basic and clinical study. In clinical research the Children's Eye Clinic offers an invaluable field of investigation. Outstanding in the United States, it was built with state funds and a bequest from the late Doctor and Mrs. John E. Weeks of Portland, and its equipment was provided by the Elks Association. In its first ten years the Clinic has served more than 8,000 children and given surgery to 1,200. The ratio of approximately one child in seven needing surgery indicates the serious condition of most patients who come to the clinic. Besides the correction of strabismus and congenital anomalies, the surgeons perform delicate operations for injuries, tumors, infantile glaucoma and cataracts, and complications associated with RLF.

Patients are referred by private physicians, public welfare commissions, and public health officers. Often the Elk liaison officers are instrumental in getting children to the clinic, and in needy cases the National Elks Foundation provides funds for travel, glasses and prostheses. Each lodge has such a liaison officer to keep his community in touch with the Medical School. The overall program is administered by the faculty of the Ophthalmology Department and the Vision Committee of the Elks Association, which has five members serving five years. This group works untiringly to publicize the program, and thus serves to educate the people of Oregon in the need for children's eye care.

### Service To Blind School

The Elks program extends to the Blind School in Salem, bringing groups of students during the school year to the Children's Eye Clinic for examination and treatment, and conducting a preschool educational program and summer camps for the blind youngsters.

In a letter to the National Society, Dr. Kenneth C. Swan, professor of ophthalmology at the Medical School, expressed the hope that this program, which has proved so successful in Oregon, might be worked out in other medical schools of the country. An attractive brochure describing the Oregon program in detail has recently been prepared.

## NSPB Adopts Low Vision Aids Program

THE national low vision aids program of the American Foundation for the Blind, a sight conservation project concerned with optical aids for the partially seeing, has been transferred to the National Society for the Prevention of Blindness.

Established three years ago by the Foundation, the program includes the stimulation of research in optical aids, development of vision aid services at the community level, provision of educational materials for professional personnel and visually handicapped persons; also the dissemination of information on all aspects of the program.

The transfer of the sight conservation activity was announced jointly by Dr. John W. Ferree, NSPB executive director, and M. Robert Barnett, executive director of the Foundation. It was approved by the NSPB Board of Directors at its meeting on June 2.

New emphasis will be placed on the use of these aids in the National Society's program for the education of partially seeing children. The problems of older persons with impaired vision will also receive special study and consideration.

The National Society will discontinue the Foundation's non-profit sales service of low vision aids, since it does not believe this to be a function of a voluntary health agency.

The low vision aids program of the Foundation was established in 1957 under the guidance of an advisory committee composed of competent professional personnel. After a study of the need for optical aids clinics in various parts of the country, the Federal Office of Vocational Rehabilitation made grants to finance such clinics under appropriate professional supervision. Twenty-six clinics now operate in 21 states.

The suggestion for absorption of the aids program by the National Society came after the Foundation noted that many of the requests for such service required a knowledge of the medical aspects of visual handicaps. The National Society's medically oriented program was more suited to direct low vision aids activities, Mr. Barnett and other Foundation officials felt.

### NSPB ACCREDITED

National organizations in the fields of health and welfare have been carefully evaluated since 1918 by the National Information Bureau, which was created to help contributors in making their philanthropic gifts. Certain basic standards of legitimate purpose and competence must be met by nonprofit organizations listed by the NIB as worthy of support.

The 1960–61 Giver's Guide lists the National Society for the Prevention of Blindness in a short list of typical accredited agencies out of nearly 600 which have satisfied the criteria of the NIB. Full and confidential reports of accredited organizations are available to Bureau members.

# GLAUCOMA DETECTION PROJECTS

EYE tests were included in the physical examination offered to physicians at the annual convention of the American Medical Association held in Miami in June. The National Society for the Prevention of Blindness arranged to have the tests for visual acuity and intraocular pressure administered. Mrs. Virginia S. Boyce, NSPB assistant director, was in charge of the unit.

The testing staff included nine practicing ophthalmologists who serve as members of the professional advisory committee of the Florida Society for the Prevention of Blindness and six physicians who are residents of University of Miami Jackson Memorial Hospital. Valuable assistance was also given by 16 members of Delta Gamma Alumnae and 10 volunteer nurses aides from the American Red Cross. The Dade County Department of Public Health provided several nurses to assist in interviewing all the physicians tested.

Of 773 individuals who were tested 35 were found to require a complete ophthalmological examination because of a suspicious increase in tension. In addition a substantial number had a marked decrease in visual acuity but did not realize it. Some of these persons were wearing glasses but had not had them changed for a long period of time. Quite a number who were under regular eye care had never had their intraocular pressure measured although they were over 40 years of age.

Through such screening in connection with scientific exhibits it is possible to reach a large number of physicians with information about the vital need for early detection of glaucoma, as well as other eye conditions that require attention.

### Screening of Nurses

At the 1960 Convention of the American Nurses Association in Miami 568 nurses were screened for glaucoma. The project was sponsored jointly by the Chronic Disease Service of the U.S. Public Health Service and the National Society for the Prevention of Blindness. Tonometry was done on four consecutive days by a resident physician from the Jackson Memorial Hospital eye clinic, assisted by a public health nurse from the Dade County Department of Health and three Delta Gamma volunteers.

As a result of the program there were 30 referrals for borderline or high intraocular tension and nine for low visual acuity. These cases are being followed up by the National Society. Among 16 reported on to date one was positive, five suspicious.

The objective of this screening was to inform nurses about glaucoma as a chronic disease and its significance as a public health problem.

### Referral Center

Marquette University's School of Medicine will offer increased services for the early detection of glaucoma through its Glaucoma Consultation and Referral Center at the medical school in Milwaukee. The *Wisconsin Medical Journal* reports that ophthalmologists can now avail themselves of complete diagnostic service for definitive work in the difficult to diagnose, or equivocal type of patient, as well as

At the 1960 convention of the American Nurses Association 568 were screened for glaucoma.

in the glaucoma patient whose intraocular pressure proves difficult to control.

Under the supervision of Dr. Lawrence L. Garner, clinical instructor in ophthalmology and director of the center, the services will include examination of the central and peripheral fields, gonioscopy, visual acuity, fundi, and special study for scleral rigidity factors employing the applanatic tonometer. Tonography studies will be performed on all referred patients and will be combined with a water provocation test in the patient whose pressure readings are in the equivocal range.

### Kansas Clinic

A glaucoma detection clinic recently conducted in Larned, Kansas attracted 1,387 persons 35 years of age and older. Forty were referred to ophthalmologists for further examination, and 16 as diabetes suspects. According to the examining staff, the rate of referral was considerably lower than the state average.

*The Observer* reports that the clinic was held in conjunction with a screening for diabetes by the State Board of Health, was approved by the Pawnee County Medical Society, and sponsored by the advisory committee to the home economics agent. Follow-up is being conducted by the county department of social welfare.

Ninety volunteers, including three ophthalmologists and 11 registered nurses participated during the two days. Many older 4-H girls, 15 of whom are interested in nursing as a career, were active in the clinic.

### Program of the Granges

A glaucoma detection clinic at Howard in Elk County, Kansas recently drew a crowd of 678 persons, of whom 66 were referred to ophthalmologists for further examination. The public was alerted to the screening by posters, newspaper stories, and the film "Hold Back the Night" which was shown to 250 people. *The Observer*, bulletin of the state division of services for the blind, reports that the clinic was set up by the seven granges in Elk County whose membership is approximately 500. At least 30 of the 75 volunteer workers were not members of a grange.

A seventh-grade class of 24 children from Howard public school attended the clinic and procedures of checking for glaucoma were explained to them. They had seen the film on glaucoma and selected this visit as a class project.

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## PROCEEDINGS OF EUROPEAN OPHTHALMOLOGICAL CONGRESS

The First Congress of the European Ophthalmological Society was held in Athens, Greece, April 18–22, 1960. (See reference to it in the article on Dr. Derrick Vail elsewhere in this issue.)

The reports presented at the Congress are abstracted in the International Congress Series No. 25 of *Excerpta Medica* in French, English and German.

# NOTES AND COMMENT

## • NSPB Research Grants

The Research Committee of the National Society has approved 1960 grants totaling $45,000, eight of them for the continuation of work already in progress, and five for new projects. Part of this amount was contributed by the E. Matilda Ziegler Foundation. The fields of study include keratoplasty, diabetic retinitis, ocular burns, etiology of uveitis, intraocular pressure, management of glaucoma and lens metabolism.

Dr. Algernon B. Reese, chairman of the committee, in announcing the grants emphasized that they should continue to be a major responsibility of the National Society and that there are many contributors who will provide funds for this purpose especially if the program can be interpreted so as to show the possible practical application of research results.

In view of funds available from the Federal government through the National Institute of Neurological Diseases and Blindness and through voluntary organizations supporting eye research, the committee recommended that the Society's funds should be allocated to those research needs not currently met through other sources.

## • Mississippi Vision Testing

Dr. N. C. Knight, Mississippi medical director of school health service, has announced that Carpenter School No. 1 in Natchez, Adams County is the first school ever to report to the state office 100 per cent visual corrections. He has commended D. G. McLaurin, superintendent of public schools, on Adams County's outstanding record.

*Mississippi's Health* reports that a five-member committee made plans for a mass visual testing program in Adams County early last fall. Teachers and PTA volunteers did the vision screening. Of the 9,970 children screened in public and private schools, 13 per cent were spotted as having possible visual difficulty. Public health nurses rechecked children having 20/40 vision or less in one or both eyes. Letters from the health department were sent to the parents of all children whose defects were reaffirmed by the second testing.

A stringent program of follow-up was done by Carpenter No. 1, which has 458 pupils. Three and one-half months after the screening the necessary treatment and correction had been completed for all children. The Lions Club matched funds for the medical correction program to pay for the examinations, treatments, and the purchase of glasses for needy children.

## • Reaching Senior Citizens

The New York State Commission for the Blind reports increasing efforts during 1959 to coordinate eye health practices into the activities of all groups working with senior citizens, in view of increasing blindness among older people (43 per cent of all newly reported cases in 1959 occurred in persons 65 years of age and older). The Commission's eye health consultants discuss eye problems with Golden Age Clubs and similar groups, and there is a wide distribution of educational literature among older persons.

Statewide public education in relation to glaucoma is being advanced, and four glaucoma detection projects sponsored by local agencies have been planned. Assistance was given to three local agencies in setting up vision screening projects in 1959. These resulted in the development of permanent local programs for screening preschool children.

A series of eye institutes was inaugurated to bring current information to professional persons interested in or responsible for eye care. The first institute, held in New York City, attracted 160 persons and was co-sponsored by the New York Association for the Blind.

Professional conferences, radio publicity, exhibits, lectures and film showings continue to alert the general public to the principles of eye health and protection. Four new publications on eye problems were issued by the Commission during the year.

## • New Jersey's Progress

The developing services of the New Jersey State Commission for the Blind, now in its 50th year, are described in the April issue of the state's *Welfare Reporter*.

In 1943 the Commission established its Eye Health Service to provide for an organized approach to prevention of blindness, and extend opportunities for sight restoration. Under the sight restoration program a staff of eye health nurses call at the homes of all newly referred individuals to evaluate the need for care and, when necessary, to urge a medical eye examination on a private basis or at a hospital eye clinic. Following the examination the Commission's consulting ophthalmologist reviews the doctor's report and a plan of treatment is established. The staff nurses, who do the necessary follow-up, report that each year approximately 300 people benefit from restored and improved vision.

The first state-wide glaucoma detection program in the United States was established in 1954. There are about 2,000 reported glaucoma cases on the Commission's registry to date. A program has also been set up for diabetic eye conditions.

In 1946 the first traveling eye unit in the United States was organized to serve public and parochial school systems in rural areas from pre-school age through high school. Approximately 4,000 students are examined each school year.

The public is constantly alerted to the Commission's eye health services, and the importance of early treatment as a factor in minimizing visual loss, through lectures, films, television and radio. The entire prevention program is under the supervision of Mrs. Emma Howe.

## • Pittsburgh Anniversary

In its 50th Anniversary report the Pittsburgh Branch, Pennsylvania Association for the Blind states that prevention of blindness has been the most flexible element of agency activity due to correlation with medical developments and corresponding changes in causes of blindness. Films, pamphlets, specially prepared papers, speeches, lectures and exhibits are valuable working tools in the agency's prevention campaign.

Medical social workers are active in a sight conservation program helping partially seeing youngsters. The branch maintains a library of large-print school books that may be borrowed by

students, and is prepared to help them secure recommended magnifying devices and other visual aids. To foster normal childhood development the agency initiated in 1956 a summer day camp for partially seeing children.

The report, which is most effectively illustrated, reflects an outstanding program.

### • Lions Sponsor Clinic

Through a grant made by District 16A Lions International a well-equipped eye clinic is being established at Beth Israel Hospital, Passaic, N. J.

A glaucoma screening program conducted by the Fort Lee, N. J. Lions Club in 1958 pointed up the opportunity for the Lions to place greater emphasis in the field of blindness prevention rather than confining their efforts to aid to the blind.

Nathan Rogoff, district chairman of the sight conservation committee, and William J. Dorman are responsible for the successful establishment of the clinic.

District 16A covers most of Hudson County, N. J. and all of Bergen County, 73 townships in all.

### • Goggles for Students

At the instance of the Georgia Society for the Prevention of Blindness the Atlanta Board of Education has provided each of the city's high schools with 50 pairs of safety goggles for the use of students in chemistry laboratories and in workshops. Mrs. Louise Peacock, secretary of the Committee, has carried on a long campaign for this protective action.

After pioneer work by the Georgia Society, an annual preschool vision screening program in Savannah has been taken over by the county PTA. At the roundup of children aged five and six years held in May 1960 Mrs. Florence Cunningham, nurse consultant of the National Society, visited Savannah to assist in the screening of 1,200 children. Approximately 100 were referred to ophthalmologists for professional examinations. The Georgia Society continues to cooperate with this project by furnishing literature, films and staff assistance.

### • Contact Lens Survey

A report on possible complications resulting from wearing contact lenses appeared in the June issue of *Good Housekeeping*. The magazine interviewed 16 ophthalmologists across the country and learned that 15 had treated corneal injuries from lenses and four of them were reported to have handled cases in which an eye was lost as a result of such damage. Some specialists in fitting the lenses believe that any such damage is due entirely to improper fitting or careless use. Some ophthalmologists maintain, however, that even properly fitted lenses may endanger the health of the eyes.

The program committee of the American Academy of Ophthalmology and Otolaryngology is planning a symposium on contact lenses for its annual meeting in October 1961.

### • Services to the Handicapped

A report of the Children's Bureau, U.S. Department of Health, Education, and Welfare, published this year, shows a considerable increase in the number of children receiving physician's services for eye conditions in the crippled children's program. *Statistical Highlights* reveals that 18,417 children

were treated for eye defects in 1958 as compared with the 5,410 in 1950.

The number treated for refractive errors increased from 154 to 4,238; for strabismus, from 3,759 to 9,609; for congenital cataract, from 236 to 572; and for miscellaneous eye diseases from 1,261 to 3,998.

State crippled children's programs served more than 325,000 in 1958, an increase of 50 per cent over 1950.

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## TREATMENT FOR ALKALI BURNS

At the 62nd Congress of the German Ophthalmological Society, R. Krueger of Munich University discussed alkali burns of the eye, which are common and often lead to blindness. In his search for a neutralizer, reports the *Journal of the American Medical Association*, Dr. Krueger determined the speed at which alkali and acid enter the eye by applying these substances to the cornea of enucleated swine eyes and recording the pH concentration in the anterior chamber. A marked pH shift to alkalinity was observed within 20 minutes after application of sodium hydroxide, potassium hydroxide, or calcium hydroxide at room temperature. Ammonia acted even more rapidly in two or three minutes.

If acids at all penetrated the uninjured cornea, they did so very slowly. Even after 90 minutes no shift to acidity was seen. When the corneal epithelium was removed, acids entered the aqueous humor as rapidly as the hydroxyl ions. Alkalis first destroy the epithelium, and the acid ions then enter readily.

Ascorbic acid was found to be the best alkali neutralizer. Within five to 10 minutes after the application of this solution the previously alkaline aqueous humor gave an acid reaction and after 15 to 25 minutes it had regained its original pH value of 7.4. Tests on the eyes of living rabbits gave the same result, but the reaction proceeded even more quickly; the aqueous humor was alkaline eight minutes after application of the alkali, and it was again neutral in only five to eight minutes after application of vitamin C. Control tests (without vitamin C) showed little if any scarring in the vitamin C-treated eyes.

These results prompted the use of ascorbic acid in treating lime burns in the human eye. Vitamin C injected under the conjunctival lesions improved the blood supply of the ischemic areas and cleared the corneal turbidity.

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## WINIFRED HATHAWAY AWARD

State commissioners of education have been invited to select nominees for the 1960 Winifred Hathaway Award which honors the Teacher of the Year in the Field of the Partially Seeing.

The objective of the award, which is sponsored by the National Society for the Prevention of Blindness, is recognition of the individual's direct service to children, and her general contribution to this field of special education.

School districts having programs for partially seeing children are asked to submit to their respective state commissioners detailed information on the candidates of their choice. An NSPB committee of educators will make the final selection from the state nominees, whose names should be sent to NSPB not later than January 1, 1961.

# AROUND THE WORLD

## AFRICA

***Control of Onchocerciasis Vectors.*** An investigation of the difficulties experienced in the control of blackflies in African countries is to be conducted by the World Health Organization. Dr. A. W. A. Brown has been appointed by the organization to visit the countries concerned and his report on the situation will serve as a basis for future research. Now head of the department of zoology, University of Western Ontario, Canada, Dr. Brown was biologist in the Division of Environmental Sanitation, WHO headquarters, from 1956 to 1958.

## GREAT BRITAIN

***Acuity of Five-Year-Olds.*** A total of 1,552 five-year-old school entrants have been vision-screened by 15 experienced school medical officers in England, Scotland and Wales. *The Medical Officer* of March 25, 1960 reports that of the 783 girls and 769 boys tested, 592 girls and 582 boys (75.6 per cent of the total) had normal vision (6/6); 108 girls and 97 boys (13.2 per cent) had defective vision (6/12 or less); 61 girls and 62 boys (7.9 per cent) had doubtful defective vision (6/9); 22 girls and 28 boys (3.2 per cent) were untestable. Of the 35 girls and 25 boys wearing glasses 54 had a squint. Excluding these children, 146 new cases (9.4 per cent) needed immediate examination and 123 (7.9 per cent) needed re-examination.

Although there appears to be a trend toward higher incidence of defective vision and squint in the girls and greater uncertainty of test response in the boys, the numbers are too small for any real comparison.

The fact that 75.6 per cent of the children had normal vision supports the theory that the normal visual acuity of five-year-old children is equal to that of adults.

This report was made by Gertrude E. Pugmire and Mary D. Sheridan, medical officers who designed the test.

***TV in Schools.*** At a recent open meeting of the London Schools' Film Society teachers commented on the increasing use that is being made of television as a classroom teaching aid. One speaker stated that three successive reports on a pupil had been received from the "eye specialist" specifying glasses required for general use, for reading, and for television. The teacher questioned the effect classroom viewing will have on children's eyes, especially in regard to the small size of the television screen.

Judging by photographs of television classes in schools, the *Optician* comments, some young students may well experience difficulty in viewing the screen clearly. It might be that teaching by TV will show up distance vision faults earlier than orthodox teaching methods.

## INDIA

***Congress of Ophthalmology.*** Dr. Y. K. C. Pandit, secretary-general of the XIX International Congress of Ophthalmology to be held in New Delhi, India, December 3–7, 1962, has announced the subjects for reports and symposia at the meeting.

Reports will be presented on tropical diseases of the eye, and on corneal degeneration.

Symposia will deal with complications of cataract operations; Eale's disease; electronic microscopy in ophthalmology; and ophthalmological problems related to the progress of aviation. Dr. Conrad Berens of New York will head the symposium on aviation problems and Dr. A. Edward Maumenee of Baltimore will participate in the one on corneal degeneration.

Complete information on the meeting will be available in a brochure which will be ready for distribution by November 1960. Inquiries should be addressed to Dr. Pandit at Bombay Mutual Building, Sir P. M. Road, Bombay 1.

The International Association for Prevention of Blindness will hold its General Assembly in conjunction with this International Congress of Ophthalmology. Dr. John W. Ferree, NSPB executive director, has accepted an invitation from Dr. A. Franceschetti, president of the Association, to serve as secretary for the Western Hemisphere, pending official election at the New Delhi meeting.

***U. S. Doctor Gives Aid.*** An American ophthalmologist who recently donated three months of his time to conducting an eye clinic at the Holy Family Hospital in Kurji, Patna, India, saw some 200 patients a day at the peak of his work, according to a report from the Medical Mission Sisters who operate the hospital. Hindus, Moslems, natives from Ranchi and Nepal and many missionary priests, brothers and sisters were among those treated at the clinic.

Dr. W. C. Caccamaise of Rochester, New York made his second trip to India in seven years to offer eye treatment or surgery to anyone needing it. He successfully performed several hundred cataract operations and is said to have made medical history in India with two corneal transplants, using corneas flown from the United States.

***POB in Bengal.*** Three traveling eye dispensaries conducted by the Association for the Prevention of Blindness in Bengal treated 49,224 persons for ocular conditions during 1958–59. According to the Association's 29th *Annual Report* much good has been accomplished and there have been requests from the public and from government officials asking that these units spend more time in their respective areas. During the year 226 blind persons were found in 175 villages with a total population of 201,625. Blindness in Bengal is primarily due to ignorance, neglect, improper treatment and poverty, and in most cases is either preventable or curable.

The eye examination and lecture unit examined 1,709 students in 28 primary schools. Of these, 251 were found to have defective vision, and 293 were suffering from eye disease.

## SPAIN

***Barraquer Institute.*** The Third International Course in Ophthalmology of the Institute Barraquer will be held May 1–5, 1961 in Barcelona, at the Avenida Palace Hotel. The enrolment is limited to 300.

The program features a symposium on surgery of the crystalline lens and intraocular plastic lenses, and one on surgery of the cornea.

For detailed information write to Dr. Joaquin Rutllan, secretary of the course, Laforja 88, Barcelona, Spain.

# CURRENT ARTICLES

***Contamination of Fluorescein and Furacin Eye Solutions.*** M. J. Mintz. *The Eye, Ear, Nose and Throat Monthly*, Vol. 39, p. 435. May 1960.

Three cases of Pseudomonas aeruginosa and Fecalis alkaligenes infection of the cornea are reported. The source of infection in these patients was traced to solutions of fluorescein and Furacin which were contaminated by the organisms.

Federal government regulations now require all commercially prepared ophthalmic solutions to be sterile when dispensed in the original bottles. However, a carelessly used eye dropper can easily contaminate the solution if the infecting organism is not susceptible to the antibiotic or solution used for preservation.

***Trachoma—Studies of Etiology, Laboratory Diagnosis, and Prevention.*** J. T. Grayston, S-P. Wang, R. L. Woolridge, Y-F. Yang and P. B. Johnston. *The Journal of the American Medical Association*, Vol. 172, p. 1577. April 9, 1960.

Material from 116 human eyes infected with trachoma on Taiwan, Formosa was used to isolate five strains of virus by culturing in the yolk sac of chick embryos. They are morphologically and serologically related to the psittacosis-lymphogranuloma venereum group. All five strains killed embryos on second passage and fixed complement with both serum from patients with lymphogranuloma venereum and a guinea pig psittacosis antiserum. So far these viruses have been grown only in the egg yolk sac, monkey eye, and human eye.

The disease has been reproduced in six blind volunteers with one of the virus strains which has been shown to be sensitive to penicillin, oxytetracycline, chloramphenicol, a sulfonamide and a nitrofurazone compound. A purified specific trachoma antigen has been prepared that measures complement fixation antibodies in the serum of trachoma patients and gives promise as a skin test antigen for diagnosis. The antigen, used as a vaccine, has produced significant antibody response in monkeys and humans. More than 450 persons given the vaccine have had no serious reactions.

Field studies are now being conducted on Formosa to obtain information on the immunology of the disease as well as data on the protective or curative effect of the vaccine.

***Experimental Trachoma Produced by Cultured Virus.*** Part II. L. H. Collier, S. Duke-Elder and B. R. Jones. *British Journal of Ophthalmology*, Vol. 44, p. 65. February 1960.

In a previous paper the authors described the results of inoculating human volunteers with virus isolated from a trachomatous patient in the Gambia. Three volunteers were inoculated by the conjunctival route, and in one, an anophthalmic man, an unequivocal infection was induced with all the conjunctival and laboratory signs of trachoma. Further human volunteers were required to establish the etiology of this disease beyond all doubt.

The present paper describes the second successful inoculation of a human volunteer with virus strain G17

isolated from a trachomatous patient in the Gambia and subjected to a serial passage in the laboratory. This strain differed somewhat in morphology from that used in the previous experiments. The typical clinical picture of trachoma in both conjunctiva and cornea resulted; the cytology of the conjunctival scrapings and the epithelial inclusion bodies were characteristic of trachoma; the virus was repeatedly re-isolated from the conjunctiva, which remained free of bacteria other than commensals. The disease in the inoculated eye and the late cross-infection which occurred in the other conjunctiva were terminated by the administration of oral sulphadiazine. It is thus established that the virus strain tested is etiologically related to trachoma.

***Epidemic Koch-Weeks Conjunctivitis and Trachoma in the Coachella Valley of California.*** C. R. Dawson. *American Journal of Ophthalmology*, Vol. 49, p. 801. April 1960.

Clinical trachoma associated with epidemic Koch-Weeks conjunctivitis was an unexpected finding of a survey conducted in the Coachella Valley of Southern California. The author, of the U. S. Public Health Service and the Francis I. Proctor Foundation for Research in Ophthalmology, made the study to confirm the suspected etiology of the seasonal conjunctivitis which has been recorded in this region for the last 30 years. The Koch-Weeks bacillus (*Hemophilus aegyptius*) has been incriminated as the etiologic agent. However, the eye gnat (*Hippelates collusor*) has been closely associated with these May-to-October epidemics in California, and the species *H. pusio* with similar epidemics in Southern Texas and Georgia. It was hoped to establish the role of this small fly in the epidemiology of the disease.

The Coachella Valley, mostly below sea level, has a typical desert climate and is populated largely by farm workers of Mexican descent. Since 1951 the local elementary schools have recorded the yearly incidence of pink eye among the pupils, and the variations in the gnat population as estimated from a system of traps. Both these factors increased with the seasonal rise in temperature. In 1951 the incidence of pink eye in the elementary pupils in the town of Coachella was 95.6 per cent; this steadily declined to 17.7 per cent in 1956, and rose to 26.2 per cent in 1957.

In October 1958 the author conducted a house-to-house survey of a Spanish-American section of Coachella, and obtained information on 499 individuals of all ages. In this group there were 169 cases of pink eye, with peak incidence (58 per cent) among children aged one to four years. During this survey 41 children referred to the school nurse with pink eye were examined clinically by the author and another ophthalmologist. They found 32 cases of acute purulent conjunctivitis (78 per cent); 28 cases of active trachoma (68 per cent); five cases of phlyctenular keratoconjunctivitis, and one presumptive case of adeno-virus infection. All but four cases of trachoma were associated with various forms of conjunctivitis.

Bacteriological studies, made at the Proctor Institute, clearly established the Koch-Weeks bacillus as the etiologic agent of the epidemics in this region. The role of the eye gnat was not clear. Eleven pools of the flies were trapped, some taken with a hand

aspirator from the faces of children with acute purulent conjunctivitis. Cultures did not reveal *Hemophilus* or other eye pathogens, but the growth of coliform organisms on the plate was so massive that more delicate organisms would have been crowded out. Thus it is possible that the flies are vectors of the bacillus, as the house fly is believed to be in Egypt. Or possibly the gnat plays an indirect role by traumatizing the conjunctiva and increasing its susceptibility to invasion by the bacillus.

While the association of epidemic conjunctivitis with trachoma in the Near East has been well documented, the discovery of this pattern in California was totally unexpected.

***An Initial Evaluation of (Aristocort) Triamcinolone and Its Acetonide Derivative in the Therapy of Ocular Inflammation.*** Part II. Clinical Studies. S. B. Chavan and E. J. Cummings. *American Journal of Ophthalmology*, Vol. 49, p. 516. March 1960.

Triamcinolone acetonide was used topically at 0.1 and 0.2 per cent concentrations in mineral oil, or in ointment base either alone or in combination with neomycin sulfate 0.5 per cent. Hydrocortisone acetate 1.0 per cent in sesame oil was used in suspension form without antibiotics. When employed simultaneously and frequently the triamcinolone preparations exerted an ameliorating and antipholgistic influence on the course of many ocular infections and allergic reactions, and appeared to be 10 times or more superior to hydrocortisone suspension.

The triamcinolone free alcohol therapy administered systemically, either alone or in combination with topical preparations of triamcinolone acetonide, with or without neomycin, produced rapid suppression of inflammatory and allergic disease. Acute and complicated eye diseases which did not respond favorably to older steroids or antihistaminic therapy, did respond favorably to triamcinolone. The anterior segment, traumatic and postoperative inflammatory diseases responded more favorably than posterior segment ocular diseases.

The toxic effects associated with systemic or local use of the preparations for short or long-term therapy were minimal. Triamcinolone and its derivative have greatly enhanced therapeutic effectiveness, increased glucocorticoid activity and diminished mineralocorticoid activity. Along with their anti-inflammatory and anti-allergic activity, they appear to have increased efficacy, potency and safety.

***Glaucoma Screening of Pittsburgh and Environs.*** R. J. Gray. *The Pennsylvania Medical Journal*, Vol. 63, p. 205. February 1960.

This survey on glaucoma screening in Allegheny County was previously reported in the Spring 1959 issue of *Sight-Saving Review*. The results indicate that 378 (1.8 per cent) of the 20,994 persons screened were found to have glaucoma in one or both eyes. The program produced an amazing public response and provided a means for excellent public education on the need for and the value of adequate eye care. Persons not screened were aware of and asking for tonometry from their own ophthalmologists.

The conclusions which can be drawn from this mass screening are: the program has to be agency-centered for

purposes of neutrality, organization and follow-up; complete medical sponsorship and cooperation insures good community relations; good publicity is essential for the success of the program; the participating hospitals receive valuable aid in their own public relations program.

***Routine Tonometry in 5,000 Patients for Detection of Glaucoma.*** J. E. L. Bendor-Samuel, W. May and H. Reed. *British Medical Journal*, No. 5176, p. 853. March 19, 1960.

Routine tonometry was performed on 5,000 patients over the age of 40 at the Winnipeg Clinic, Manitoba, Canada. In 217 patients (4.3 per cent) the intraocular pressure was found to be above 25 mm. of mercury in one or both eyes though no other clinical signs of glaucoma were present. A Schiøtz or a Mueller electric tonometer was used.

Eighty-two of the patients failed to attend for a follow-up examination. Of the 135 investigated, 92 were considered to be non-glaucomatous and 43 to have the disease. Glaucoma had also been diagnosed on clinical grounds in another 43 patients at the original examination. Thus the disease was found in 86 patients (1.7 per cent). Since all those advised did not attend for further investigation, the authors estimate that about 2 per cent of the 5,000 had glaucoma. This finding is in keeping with the results of similar studies which have been conducted in the U.S. and in Europe.

The authors advise that routine tonometry be performed on all persons over the age of 40. Those having an intraocular pressure above 25 mm. of mercury should be referred to an ophthalmologist.

***Community Glaucoma Screening —A Case Report on Preventable Blindness.*** W. H. Havener, D. Johnson and M. Keller. *The Ohio State Medical Journal*, Vol. 56, p. 497. April 1960.

A project to screen individuals over 40 years of age for glaucoma was conducted by the Columbus and Franklin County Departments of Health, Ohio, in cooperation with the Columbus Eye, Ear, Nose and Throat Society, and the Department of Ophthalmology of The Ohio State University in April 1959. Of a total of 8,535 persons screened, 373 (4.4 per cent) were found to have a pressure of 25 mm. Hg. or higher. They were referred to ophthalmologists of their choice. Medical reports received on 334 indicated that 138 (1.6 per cent of the total group screened) did have glaucoma and had been started on treatment. No medical follow-up could be obtained on 39 patients.

Screening of the glaucoma group's relatives over the age of 40 is planned for the near future. Reports indicate that from 10 to 25 per cent of such relatives do have the disease.

***Effects of Phospholine Iodide (217MI) on Intraocular Pressure in Man.*** S. M. Drance and F. Carr. *American Journal of Ophthalmology*, Vol. 49, p. 470. March 1960.

This study was conducted to test the effect of phospholine iodide, a synthetic, powerful cholinesterase inhibitor, on normal human eyes and to ascertain its hypotensive effect on glaucomatous eyes.

The five nonglaucomatous patients had 0.25 per cent of the drug instilled in one eye. It produced a marked fall in intraocular pressure about 12 hours after instillation which persisted for

approximately three to five days. The untreated eyes, which served as a control, showed no more than the daily diurnal variation in pressure. Tonographic studies revealed a marked increase in the facility of outflow in the treated eyes, and a very slight decrease in the facility of outflow in the untreated eyes.

Of the 59 eyes with chronic simple glaucoma treated with 0.25 and 0.1 per cent phospholine iodide, 57 showed a satisfactory drop in intraocular pressure. No explanation can be given for the two eyes in the same patient which failed to respond to the drug. Tonographic studies were carried out on 28 of the 59 eyes and the average increase in facility of outflow was 127 per cent. The systemic disturbances two glaucomatous patients had following the local use of the drug were reversed by systemic atropine sulfate. The unpleasant side-effects experienced by both the normal and glaucomatous eyes seemed to wear off with continued use of the drops.

***Symposium: Office Management of the Primary Glaucomas.*** *Transactions American Academy of Ophthalmology and Otolaryngology*, Vol. 64, p. 105. March–April 1960.

The aim of the symposium was to clarify the diagnostic steps needed in primary glaucoma detection and to outline the practical and efficient office management of the disease. Each member of the panel discussed briefly an assigned portion of the material to be covered. Following each discussion questions were presented to the panel.

F. Bruce Fralick introduced the subject, and George M. Haik began the discussion with the classification, signs and symptoms of the primary glaucomas. Gonioscopy, ophthalmoscopy and perimetry were reported on by Robert N. Shaffer. Bernard Becker discussed tonometry, tonography and provocative tests in the management of the glaucomas and W. Howard Morrison dealt with the medical therapy.

***Use of Echothiophate (Phospholine Iodide) in the Treatment of Glaucoma.*** R. C. Lawlor and P. F. Lee. *American Journal of Ophthalmology*, Vol. 49, p. 808. April 1960.

A clinical trial was made of a new cholinesterase inhibitor, echothiophate, developed as an agent for lowering intraocular pressure in glaucomatous eyes. Over a period of 12 months the effects of the drug were observed in 52 eyes of 41 patients at the Glaucoma Consultation Service of the Massachusetts Eye and Ear Infirmary. In 35 cases open-angle glaucoma was involved, in three angle-closure, in another three the glaucoma was secondary to peripheral anterior synechias after lens extraction.

Echothiophate has the advantage over DFP and other cholinesterase inhibitors of being soluble and stable in water rather than oil, but in aqueous solution it requires refrigeration. It was used in concentrations of either 0.125 per cent or 0.25 per cent at intervals from twice daily to twice weekly. In this study, intraocular pressures above 23 mm. Hg. were considered uncontrolled. The drug was found to lower intraocular pressure and improve facility of outflow in 27 of 38 eyes in which other chemotherapy, including DFP and Diamox, had failed, and was uniformly effective in the 14 eyes previously controlled or untreated.

Side effects similar to those produced by DFP were noted: transient blurring, supraorbital pain during the first days of use, and marked miosis. Iris cysts developed at the pupillary border in three cases after three months or more of therapy, and one patient developed allergic conjunctivitis at the end of the tenth month.

***Report of the Committee on Use of Alpha-chymotrypsin in Ophthalmology.*** *Transactions American Academy of Ophthalmology and Otolaryngology*, Vol. 64, p. 16. January–February 1960.

In an attempt to solve the problems presented by the use of alpha-chymotrypsin in cataract surgery, a committee was established in 1958 by the Council of the Academy of Ophthalmology and Otolaryngology. Its report was presented at the Academy's Sixty-Fourth Annual Session in October 1959.

The report includes a review of the biochemistry and pharmacology of alpha-chymotrypsin by Dr. Bernard Schwartz; Dr. Ludwig von Sallmann's experimental studies of the ocular effects of the enzyme; and a discussion by Dr. A. Edward Maumenee of the enzyme's effect on the retina. Dr. Richard C. Troutman reports on a national survey conducted to determine the effects of the use of the enzyme in a large number of cataract cases. A report of a double-blind therapeutic trial of the effect of the drug is contributed by Dr. Schwartz in collaboration with Dr. Martin Corwin and Robert Israel.

The committee's findings were summarized by Dr. Derrick Vail, chairman. It was emphasized that alpha-chymotrypsin should not be used in lens surgery in a patient under twenty years of age, in endothelial dystrophy, in subluxated lenses, and in traumatic cataract, especially when vitreous is present. It was recommended that zonulysis be used conservatively until more information is obtained on this process.

***Plain Versus Chromicized Catgut Sutures in Cataract Surgery.*** G. T. Kiffney, Jr. and F. W. Stocker. *American Journal of Ophthalmology*, Vol. 49, p. 711. April 1960.

Mildly chromicized buried 6-0 catgut sutures for corneoscleral wound closure, used in 100 cataract extractions in 1956, proved to involve one undesirable complication. In about 15 per cent of the cases one or both sutures perforated the conjunctival flap (which was very thin in these instances), affording the chance of epithelial downgrowth and possible infection along the suture track. This was due to the fact that the chromicized suture was not completely absorbed for several weeks.

Accordingly a trial was made of plain 6-0 catgut sutures in a series of 130 cataract extractions, and the results were evaluated after a period of three months to more than two years. Erosion of the plain catgut occurred in only 3 per cent of the cases, due to the more rapid absorption of the sutures.

There was somewhat more postoperative astigmatism with the plain catgut than with the chromicized; the total average was 1.47 diopters as against 1.06 D. However, 81.6 per cent of the patients had less than 2 D. of postoperative astigmatism, and only 4.6 per cent had more than 3 D. In 108 extractions the visual results were 20/30 or better; most of the 22 cases

of poorer vision were due to disease processes not connected with the cataract surgery. Hyphemas and persistent edema of the conjunctival flap, possibly attributable to the sutures, eventually subsided. There was only one case of postoperative glaucoma and none of postsurgical infection.

The plain catgut sutures are recommended as maintaining adequate closure with rapid absorption of suture material, affording the patient a smoother and safer postoperative course.

***The Present Status of Contact Lenses.*** K. E. Sandt. *The Journal Lancet*, Vol. 80, p. 99. March 1960.

The early development of contact lenses and the two main types, scleral and corneal, are described. It is estimated that approximately 6,000,000 people now wear these lenses, and that the number is increasing steadily.

The author discusses the uses of the lenses, the fitting procedure and the rechecking routine. Bifocal contacts are said to be in an experimental stage and are not widely prescribed.

***Functional Results with Contact Lenses in Unilateral Congenital Cataracts, High Myopia and Traumatic Cataracts.*** P. G. Spaeth and P. M. O'Neill. *American Journal of Ophthalmology*, Vol. 49, p. 548. March 1960.

Many amblyopic children have been neglected, ignored, or partially treated because of the associated problem of anisometropia. Early treatment is necessary if the desired result of first-, second-, or third-degree fusion is to be obtained.

Scleral-type contact lenses gave satisfactory functional and cosmetic results in this study to the 24 patients between the ages of five and 16, including the congenital uniocular cataract patient made aphakic by successful surgery, the patient with congenital high anisometropia, either myopic or hyperopic, and the patient with traumatic cataract made aphakic by successful surgery. Seventeen patients achieved third-degree fusion with contact lenses.

***Results of Implantation of Intraocular Lenses in Unilateral Aphakia: with Special Reference to the Pupillary or Iris Clip Lens—a New Method of Fixation.*** C. D. Binkhorst. *American Journal of Ophthalmology*, Vol. 49, p. 703. April 1960.

A follow-up of 11 patients fitted with intraocular lenses by the Ridley method was made 36 to 39 months after implantation. No untoward conditions had developed, and in a few instances the visual acuity had actually improved over the level observed a few months after the prothesis was fixated. The author believes this indicates that the contact of the lens with the posterior surface of the iris is well tolerated.

On the other hand, when the lens is in contact with the anterior chamber angle and the posterior surface of the cornea, damage is apt to result. The methods of Strampelli, Dannheim and others—supporting the lens in the anterior chamber angle—gave rise in six months to a year to corneal edema in about a fourth of the cases examined by the author.

To prevent these lesions in the anterior chamber, the author designed what he calls the pupillary or iris clip lens, a very light prothesis supported entirely by the iris diaphragm having

only minimal contact with the anterior and posterior iris surfaces. Implantations of these lenses, located immediately in front of the pupil and fixated by two wire loops, were performed in 29 patients with unilateral aphakia. When reported to the Dutch Ophthalmological Society about six months later, this type of fixation appeared to be well tolerated.

***Symposium on Sports Injuries: Injuries to the Eye.*** A. G. DeVoe. *The American Journal of Surgery*, Vol. 98, p. 384. September 1959.

Serious eye injuries in sports appear to relate chiefly to boxing in which a deliberate attempt is frequently made to inflict damage to the eyelids in the form of lacerations, edema and hematomas.

In general, individuals who are prone to ocular injury, those with a high degree of myopia, and those with only one useful eye should not be permitted to take part in contact sports. Those with less than 20/200 uncorrected vision or with corrected vision less than 20/20 should consult an ophthalmologist before engaging in athletic activity. Wearing glasses should not be a serious handicap to athletes participating in a non-contact sport such as tennis, track, golf, skiing, etc. However, non-shatterable lenses (plastic or case-hardened) should be worn. Unfortunately plastic lenses scratch easily.

Contact lenses are practical and are being worn by many professional and college athletes. Corneal lenses are more comfortable and in general can be worn for a longer period than scleral lenses. However, they are more readily lost and cannot be worn by swimmers, as can the scleral type. Several special types of eyeglass frames have been devised for those who cannot tolerate contact lenses.

***Observations of Pleoptic Diagnosis and Treatment.*** G. Wilson and H. M. Katzin. *American Orthoptic Journal*, Vol. 10, p. 17, 1960.

The paper is one of four presented at the symposium on pleoptics in the treatment of strabismus at the annual joint meeting of the American Orthoptic Council and the American Association of Orthoptic Technicians.

The instruments and techniques advocated by Professors Bangerter and Cüppers are described. The authors consider the factors in applying European techniques to patients in this country, and how this new concept might affect some of our present methods of dealing with cases of strabismus. Some procedures that might be used if pleoptic equipment were not available are discussed.

Since pleoptics is a new method the authors are unable to discuss the therapeutic results. However, they are convinced that the method sheds invaluable light on diagnostic problems.

***Freshman Visual Screening Program at Columbia University.*** M. Schrier. *American Journal of Optometry and Archives of American Academy of Optometry*, Vol. 37, p. 245. May 1960.

This program was adopted at Columbia in 1956 as part of the freshman physical examination. The four year record has revealed that about 30 per cent of the entering students have some visual problem that might jeopardize their scholastic achievement.

It is hoped that in future vision problems can be correlated with reading problems at the college.

***The Psychology of Color in the Schoolroom.*** F. Birren. *Better Light Better Sight News*, Vol. 26, p. 10. November 1959.

Color, for all its esthetic and emotional charm, should be applied with some measure of attention to the needs of child welfare and education. If it is used merely as decoration in the school many of its remarkable benefits may be lost or overlooked.

The stimulation of color is good tonic to the senses and good distraction from fears and apprehensions. While a gray world tends to lead to subjective moods, inner tensions and monotony, color provides normal emotional outlets.

Bright light and stimulating colors are conducive to physical and muscular activity and are therefore highly appropriate for kindergartens and places of diversion. The more subdued colors tend to inspire introspection and are thus conducive to physical relaxation and mental activity.

The author suggests a basic color plan for the classroom. He emphasizes that if the needs of education are listed and the functions of color are checked against them, such a plan will automatically shape up to become both unique and right for its sound purpose.

***Current Methods of Corneal Preservation.*** J. H. King, Jr. *Survey of Ophthalmology*, Vol. 5, p. 253. June 1960.

Increased demands for corneal tissue cannot be met by the supply available for keratoplasty; better methods of preserving donor tissue are constantly being sought. However, it is not necessary to use fresh tissue in lamellar keratoplasty, the procedure of choice in chronic neurotropic or viral keratitis, and one entailing less risk for the patient than penetrating grafts, which do require fresh corneal material.

The three methods for preserving corneas are evaluated: freezing after treatment with glycerine and storage in the frozen state; freeze-drying (lyophilization) and storage in vacuum at room temperature; and dehydration in glycerine and storage in vacuum at room temperature. The third method is preferred by the author. All three modes of preservation make the tissue nonviable, but for lamellar grafting viability is not required; in fact, there is considerable argument in favor of stored tissue as superior to fresh.

It is suggested that fresh corneas received in eye banks should be reserved for penetrating grafts, which require a functioning endothelium. Then, by establishing preservation units in centralized eye banks, stored tissue would be available for lamellar grafting and also for emergency penetrating grafts when it is a question of saving an eye. Occasionally corneas stored by any of the three methods described have yielded clear penetrating grafts, but the use of preserved tissue in this type of keratoplasty is not recommended if fresh corneas are available.

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**1961 NSPB CONFERENCE**

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# BOOKS AND PAMPHLETS

**THE TRANSPARENCY OF THE CORNEA. SYMPOSIUM: THE COUNCIL FOR INTERNATIONAL ORGANIZATIONS OF MEDICAL SCIENCES.** Editors: Sir Stewart Duke-Elder and E. S. Perkins. Charles C Thomas, Springfield, Ill. 1960. 268 p. $10.00.

This symposium, held at Knokke-le-Zoute, Belgium brought together 22 experts on the cornea, both clinicians and research workers. In his introduction to the various papers presented Sir Stewart Duke-Elder sums up the problems that were considered as follows:

Why is the normal cornea almost transparent? How is transparency maintained during life? What is known of the pathological factors that cause loss of transparency and how can they be prevented? How can transparency in corneal grafts be maintained?

Valuable features of the report are an extensive bibliography and a carefully prepared index.

**GLAUCOMA: TRANSACTIONS OF THE FOURTH CONFERENCE, MARCH 1959.** Editor: Frank W. Newell, M.D. Josiah Macy, Jr. Foundation. 1960. 258 p. $8.00.

The conferences sponsored by the Josiah Macy, Jr. Foundation are an attempt to stimulate research and to promote effective communication between the professions and specialties. More than 200 conference groups have been sponsored in the past 15 years, each limited to 25 participants who represent a multidiscipline approach to some urgent problem in the field of medicine and health.

This volume includes discussions by leading ophthalmologists dealing chiefly with the trabecular structure in man and its role in the problem of simple glaucoma; structure of the ciliary epithelium and its relationship to aqueous secretion; and pathologic findings on six eyes with primary glaucoma.

The reporting of the sessions is in an informal style of give and take, without summary, but comprehensive reference material is listed.

Leaders in the discussions included Levon K. Garron, Ake S. Holmberg, Norman Ashton, George D. Pappas and Abraham L. Kornzweig. The text is well illustrated, with excellent typography.

**ADMINISTRATION OF PUBLIC HEALTH SERVICES.** Ruth B. Freeman, R.N., Ed.D. and Edward M. Holmes, Jr., M.D., M.P.H. W. B. Saunders Company, Philadelphia. 1960. 508 p. $6.75.

Public health has evolved from a simple program originally designed to control communicable disease and assure sanitary measures to a highly complex one that includes many individualized services required for modern disease control, rehabilitation and health education.

Nationwide expenditures for these projects run into billions of dollars a year and involve the services of hundreds of thousands of workers of diverse skills, disciplines and professional backgrounds. Thus public health administration demands knowledge of the tools, techniques, controls and precepts used in well-managed business enterprises.

The authors apply the principles of sound management to the particular demands of public health services, governmental and voluntary. The approach is not only in terms of top management responsibility, but of that of the physicians, nurses, administrators and other disciplines functioning in positions demanding some degree of administrative skill.

In addition to the administrative process, sections of the book deal with program planning and implementation; management and development of personnel; enlisting public cooperation; and future trends in public health administration.

**PHYSICAL DISABILITY: A PSYCHOLOGICAL APPROACH.** Beatrice A. Wright. Harper & Brothers, New York. 1960. 408 p. $6.00.

The author, who is a member of the department of psychology, University of Kansas, approaches the social-psychological side of disablement from a scientific viewpoint, whereas heretofore it has been largely a welfare specialty based on experience. As a basis for discussion she uses not separate disability categories but situations common to all disability groups.

The first part of the book analyzes some important problems and solutions arising from the social and personal evaluation of a disability; the second, more clinical, part is concerned with the practical problem of how the person himself and the parent may be effectively encouraged to meet the challenge imposed by disability. The final chapter discusses the heritage of somatopsychology and underscores essential findings and conclusions.

Emphasis is given to the fact that physique as defined medically in physical terms is not unequivocally related to behavior. For example, a substantial percentage of children who are classified as legally blind can learn by visual methods. Physical limitations may produce suffering and frustration, but the limitations imposed by the evaluative attitudes toward physique cut far deeper and spread far wider; they affect the person's feelings about himself as a whole.

Various sections of the text include discussions of inferior and salutary status positions; frustration and uncertainty; value changes in acceptance of disability; development of the self-concept and the perception of interpersonal relations; training in social skills; the parent as a key participant; the client as co-manager in his rehabilitation; and an assessment of the field of somatopsychology.

An extensive bibliography and an index of names are included. A minimum of technical language is used.

**TRANSACTIONS OF THE OPHTHALMOLOGICAL SOCIETY OF THE UNITED KINGDOM.** Vol. LXXIX, Session of 1959. J. & A. Churchill, Ltd., London. 1960. 780 p.

This volume includes the papers presented at the 79th Congress of the Society held at the Royal Society of Medicine, London, April 9–11, 1959; also the proceedings of affiliated societies and lists of members.

The annual Bowman Lecture was delivered by L. Paufique whose subject was "The Present Status of the Treatment of Retinal Detachment." Dermot Pierse and J. E. H. Cogan discussed cataract extraction with alphachymotrypsin. Numerous papers dealt with various aspects of glaucoma, including one presented by F. C.

Rodger, H. S. Saiduzzafar and Y. Dayal on the effect of citral and Vitamin A on the disease.

D. Ainslee reported on a survey of 100 penetrating corneal grafts.

The text is profusely illustrated with photographs, many in color, diagrams and tables. Several of the papers will be abstracted for *Sight-Saving Review.*

**Dictionary of Visual Science.** Editors: Max Schapero, B.S., O.D.; David Cline, B.S.; and Henry William Hofstetter, B.S., M.S., Ph.D. Chilton Company, Philadelphia, Pa. 1960. 788 p. $15.00.

With the cooperation of numerous authorities the editors have attempted to compile a dictionary covering the terminology of the visual sciences. Included are more than 13,000 listings in the field of ocular anatomy, embryology, physiology, pathology, histology, and genetics; also optics and orthoptics, low vision aids, and many other related subjects.

The compact volume should be a valuable and reliable reference for those directly concerned with vision, as well as those interested in the visual aspects of other fields of interest. It is a unique contribution to the literature.

**Highlights of Progress in Research on Neurological and Sensory Disorders-1959.** U.S. Department of Health, Education, and Welfare. Washington 25, D. C. 1960. 52 p. 25 cents.

Items of interest on program developments and research studies conducted and supported during 1959 by the National Institute of Neurological Diseases and Blindness are outlined in this pamphlet. Neurological and sensory disorders are reported to be the primary cause of lifelong crippling in the United States and rank third as the cause of death.

The Institute's continued progress in clinical and basic research produced important findings in vision disorders. There were approximately 278 grants relating to vision in 1959. Among the research advances is the discovery of a new congenital eye disorder found to be prevalent in an isolated area of North Carolina. It manifests itself by the presence of gelatinous patches at the junction of the cornea and conjunctiva and is associated with comparable lesions of the mouth mucous membrane. Other studies already published relate to cataracts induced by a toxic agent; early glaucoma therapy; and experimental chorioretinal burns induced in animals by indirect ophthalmoscopy.

Included are progress reports on major neurological conditions: multiple sclerosis, epilepsy, disorders of the central nervous system, brain and cerebral cortex, cardiovascular diseases and many others.

**The Exceptional Child. A Book of Readings.** James F. Magary and John R. Eichorn. Henry Holt and Company, New York. 1960. 562 p. $5.50.

Material in the various areas of special education is brought together in this book of 71 readings, each by a recognized authority. Consideration is given to those children who can benefit from special services or a special curriculum in their daily school routine. Concentration is on the child, rather than on his particular handicap.

A brief section touches on the education of partially seeing children. It is unfortunate that more attention has not been paid to the current material

available in this field and recommended by the National Society for the Prevention of Blindness.

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**SEEING EYE WIFE.** Virginia Moore. Chilton Company, Philadelphia. 1960. 178 p. $2.75.

Seldom has this reviewer been so fascinated by an autobiography with a message. It would be a very insensitive reader indeed who didn't get the message—that there is little difference between the blind and sighted and what there is comes from lack of understanding on the part of the sighted. The author not only tells what this understanding should be but also gives practical guidance for acquiring and using it to mutual benefit.

There is nothing pollyannaish, or maudlin, in this account of the courtship, marriage and family life of a sighted wife and blind husband. It is simply a sensitive, realistic true story of two highly intelligent, warm personalities with a grand sense of humor and a son to bless their union.

The book richly deserves documentary film treatment and a wide reading audience.

J. W. F.

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## NEW MAGAZINE IN FIELD OF REHABILITATION

*Rehabilitation Record* is a new periodical published by the U.S. Office of Vocational Rehabilitation, designed to transmit information on new projects and findings in this field to people who are providing such services, or working directly with handicapped persons. The first issue, January–February, 1960 featured a number of articles by rehabilitation authorities, announcements of meetings, news of training activities and reports of state vocational rehabilitation agencies.

The *Record* is distributed without charge to officials of the Office of Vocational Rehabilitation, state agencies dealing with rehabilitation of handicapped persons, as well as cooperating voluntary agencies. It is also available on subscription at $1.75 a year (single copies 30 cents) from the Superintendent of Documents, U.S. Government Printing Office, Washington, D. C.

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## POLLACK TEXT IN SPANISH

Philip Pollack's valuable book "The Truth About Eye Exercises," published by Chilton Company, Philadelphia in 1956, has recently appeared in a Spanish edition which is available from Compania General Fabril Editora, Buenos Aires. (Paper cover, $1.50.)

The English edition was reviewed in *Sight-Saving Review*, Winter 1956. The text presents the scientific evidence that for many years has revealed the errors in Bates's theories. It is a well-documented summary of the fallacies of eye-exercise faddists.

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## ILLEGAL STAKE

A $41,500 settlement was awarded an eight-year-old Illinois girl who lost her left eye as a result of falling on an iron stake placed upright in a neighbor's lawn. The stake was the kind often used to support wires which keep persons off the lawn, but no wires were attached to it when the accident occurred. The defendant was the owner of the property on which the stake was placed.

The attorney representing the girl contended that allowing the stake to remain was a negligent act, and that suit could be brought under the Chicago city code which prohibits pointed instruments of any kind from protruding unless they are at least six feet high or less than six inches from the ground. He pointed out that children customarily played on the street and that the girl could not be charged with contributory negligence because of her age.

# OPHTHALMOLOGY

## SECTION XII

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